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URBAN RESIDENTIAL LAND DEVELOPMENT
POLICY IN IRAN
A CASE STUDY OF ARAK

by

MOHAMMAD MEHDI AZIZI

A thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy

Department of Urban and Regional Planning
Faculty of Architecture
University of Sydney

September 1995
ABSTRACT

In 1985 a new urban land development policy in Iran was initiated to curb rapid urban expansion. This study investigates the appropriateness or otherwise of the new policy in relation to patterns of land supply, infrastructure provision and environmental issues for new urban residential areas using a post-policy evaluation. The study explores in detail the outcomes of the new policy using the city of Arak as a case study. The assessment of outcomes was undertaken according to three main normative criteria including effectiveness, equity, and environmental quality. The study reveals several major points. Firstly, with respect to the issue of land supply, the implications of the study findings were largely related to public land ownership, rather than urban land development policy. Secondly, while financing infrastructure is shown to be the critical issue in the literature, the in-depth analysis of the user-pays system in Iran highlighted a number of issues. Two of the important findings were: the larger the size of projects, the greater was the positive balance between governmental expenditure and user payments; and the larger the size of cities, the greater was the positive balance. The tasks of fee assessment and collection were, however, found to be amongst the major shortcomings of the user-pays system. Thirdly, in the context of environmental quality, significant issues included the need for urban expansion on the one hand, and environmental threats such as the degradation of agricultural land and sanitation on the other. Based on the study findings, examples of policy objectives, performance criteria, targets, and data requirements are presented. The study also postulates that the general process of physical planning at either the national or local levels influences levels of effectiveness arising out of land development policies. Finally, areas for further research are highlighted.

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Thanks be to God for His grace and countless blessings.

Dedication

To my wife Esmat and two children Etham and Mohammad Ali, for their great encouragement, understanding, patience and support during the pressures of the last few years; to my mother for her encouragement and for four long years of patience; and to the loving memory of my father.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>iv</td>
</tr>
<tr>
<td>List of tables</td>
<td>x</td>
</tr>
<tr>
<td>List of figures</td>
<td>xii</td>
</tr>
<tr>
<td>List of plates</td>
<td>xiii</td>
</tr>
<tr>
<td>Abbreviations and glossary</td>
<td>xiv</td>
</tr>
<tr>
<td><strong>Chapter 1: INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>1.1 The nature of the residential land development problem in Iran</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Study objectives, hypothesis and research questions</td>
<td>10</td>
</tr>
<tr>
<td>1.3 Research method</td>
<td>14</td>
</tr>
<tr>
<td>1.4 Structure of the thesis</td>
<td>19</td>
</tr>
<tr>
<td><strong>Chapter 2: THE CONTEXT OF RAPID URBAN EXPANSION IN NEWLY INDUSTRIALISING COUNTRIES</strong></td>
<td></td>
</tr>
<tr>
<td>2.1 The dynamics of urban growth and urban expansion</td>
<td>22</td>
</tr>
<tr>
<td>A question of rapid population growth</td>
<td>23</td>
</tr>
<tr>
<td>Residential land and urban development</td>
<td>27</td>
</tr>
<tr>
<td>Economic factors</td>
<td>31</td>
</tr>
<tr>
<td>Industrialisation</td>
<td>32</td>
</tr>
<tr>
<td>Employment</td>
<td>34</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>36</td>
</tr>
<tr>
<td>Social issues</td>
<td>38</td>
</tr>
<tr>
<td>2.2 Roles of urban government</td>
<td>39</td>
</tr>
<tr>
<td>Public land acquisition</td>
<td>40</td>
</tr>
<tr>
<td>Land readjustment-land pooling</td>
<td>43</td>
</tr>
<tr>
<td>New towns</td>
<td>45</td>
</tr>
<tr>
<td>2.3 Key themes for the critical study of residential land development</td>
<td>50</td>
</tr>
<tr>
<td>Land supply</td>
<td>51</td>
</tr>
<tr>
<td>Infrastructure provision</td>
<td>52</td>
</tr>
<tr>
<td>Environmental quality</td>
<td>54</td>
</tr>
<tr>
<td><strong>Chapter 3: THE CONTEXT OF URBAN EXPANSION AND URBAN DEVELOPMENT IN IRAN</strong></td>
<td></td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>56</td>
</tr>
<tr>
<td>3.2 Population growth and urbanisation process</td>
<td>56</td>
</tr>
<tr>
<td>3.3 Housing conditions</td>
<td>62</td>
</tr>
<tr>
<td>Housing production and demand</td>
<td>63</td>
</tr>
<tr>
<td>Floor space, housing types and density</td>
<td>66</td>
</tr>
<tr>
<td>3.4 Pre-revolutionary urban development</td>
<td>68</td>
</tr>
<tr>
<td>vi</td>
<td></td>
</tr>
</tbody>
</table>
3.5 Post-revolutionary urban development 73
3.6 Urban land development in 1979-1985: a critical period 75
3.7 Conclusion 78

Chapter 4: EVALUATING URBAN LAND DEVELOPMENT:
INFRASTRUCTURE AND ENVIRONMENTAL ISSUES 80
4.1 Introduction 80
4.2 Evaluation of effectiveness and equity considerations in urban land development 80
   Evaluation procedure 80
   Effectiveness 84
   Equity consideration 87
4.3 Environmentally sustainable development 90
   The need for sustainable development 90
   Site selection and the environment 93
   Physical environment 95
4.4 Conclusion 97

Chapter 5: AN EVALUATION OF URBAN RESIDENTIAL LAND DEVELOPMENT POLICY IN IRAN 99
5.1 Introduction 99
5.2 The new urban land development policy of 1985 100
   Institutional arrangements 100
   The process of urban land development 102
   Non-governmental land development 105
   Financing new land development projects 107
5.3 Implementation effectiveness 110
   Cost-recovery effectiveness and findings of data analysis 111
   Variables in user-pays system 112
   Projects scale and user payments 115
   City size and user payments 117
   Length of implementation and user payments 119
   Financial status and user payments 122
   Physical conditions and user payments 124
   Inflation and user payments 125
   Cost-recovery effectiveness in medium sized cities 127
   Land supply effectiveness 129
5.4 Conclusion 134

Chapter 6: GROWTH AND CHANGE IN THE PROVINCIAL CITY OF ARAK 136
6.1 Introduction 136
6.2 Regional context 137
6.3 The 1960s Growth Pole Strategy and its impacts on the region 139
   Demographic impact 140
9.3 Iran's urban land development and urban planning 260
9.4 Further research 264

Appendices

1 Interview questionnaire 267
2 Official guidelines 269
3 Arak master plans 275
4 Survey questionnaire 278

References 279

Addendum: Published papers 302
LIST OF TABLES

1.1 Aims of Iranian Urban Land Development Projects 7
2.1 Average annual growth of population 23
2.2 Classification of Iranian cities in 1986 49
3.1 Comparison of the urban population of Iran and other countries 58
3.2 Rate of population growth by urban and rural areas, 1956-1986 59
3.3 Population forecasts, millions 60
3.4 Overcrowding figures: number of families per unit (percentage) 64
3.5 Percentage of Tents, Huts, Hovels, etc. 65
3.6 Floor space per capita: a comparison 66
3.7 Average floor space (existing and new) in urban area (Square metres) 66
3.8 Existing density pattern in urban areas of Iran 67
3.9 Urban Development Projects in the Third Plan (1963-1967) 69
5.1 Criteria for pricing allotments in land development projects in Iran 109
5.2 All urban land development projects in Iran, 1985-1991 113
5.3 Results of correlation analysis with the ration variable 115
5.4 The effects of city size on user payments: major projects in large cities 118
5.5 Free market land price in 18 cities in 1992, Rials per square metre 119
5.6 Expenditures, user-payments and balance in different provinces 122
5.7 Major projects started in 1987 which had higher negative balances 123
5.8 The effects of physical conditions on user payments 124
5.9 Impacts of inflation on ratio 126
5.10 Results of user-pays system in medium sized cities 128
5.11 Urban land demand during the First Five Year Plan, 1989-1993 130
5.12 Residential land distribution pattern by ULO by City Size in Iran 133
6.1 Trend of population growth of Arak during four official census 141
6.2 Unemployment in Iran, the Province, Arak in 1986 143
6.3 Employment in the city of Arak in the four censuses from 1956-1986 144
6.4 Number of employees by sector in Arak in 1976 and 1986 144
6.5 1966 land use pattern and 1991 proposals 147
6.6 Land use pattern in existence in 1985 and proposed for 1995 156
6.7 Trend of changes in residential area in Arak in selected years 160
7.1 Trend in the number of housing production in Arak, 1977-1984 166
7.2 Growth in families and dwellings in Arak, the province and Iran 167
7.3 Owner occupation between Arak, Markazi province and Iran in 1986 168
7.4 Overcrowding: the number of dwellings by family in 1966 169
7.5 Overcrowding indicators in Arak, Markazi Province, Iran 170
7.6 Housing demand in Arak predicted in 1977 171
7.7 Housing quality in Arak, Markazi Province and Iran, 1986 173
7.8 Infrastructure conditions in Arak, the province and Iran in 1986, % 180
7.9 Income and expenditure of the municipality of Arak in selected years 185
8.1 Overall information about all projects in Arak, 1985-1991 191
8.2 The land use pattern in the Gerdoo Project 196
8.3 Land use in the final layout of the "102-Hectare Project" 197
8.4 Density pattern in "102-Hectare Project" 197
8.5 Land use pattern in the first land development project of Mohajeran 198
8.6 Dwelling pattern in the initial plan, "102-Hectare Project" 203
8.7 Initial and revised plans of the "102-Hectare Project" 203
8.8 Dwellings pattern in the Gerdoo Project 210
8.9 Dwelling pattern in "102-Hectare Project" 210
8.10 Residential lot types in Mohajeran new town 213
8.11 Proposed housing supply by land development projects in Arak 214
8.12 Land needs and supply in Arak, 1986-1991 214
8.13 The proportion of public and private investment on housing (%) 217
8.14 Infrastructure costs in the 102-Hectare Project" 220
8.15 Actual infrastructure costs in Gerdoo Project 220
8.16 The results of user-pays system in Arak by 1992 223
8.17 Nominal and real expenditure and user payments in 'Gerdoo' 227
8.18 Nominal and real balance and ratio in 'Gerdoo' 227
8.19 Nominal and real expenditure and user payments in '70-Hectare' 228
8.20 Nominal and real balance and ratio in '70-Hectare' 228
8.21 Nominal and real expenditure and user payments in '16-Hectare' 228
8.22 Nominal and real balance and ratio in '16-Hectare' 229
8.23 Financial status of families of the Province and Iran 1985 231
8.24 Income distribution comparison in Arak in 1986 231
8.25 Financial status of land applicants in Arak in 1986 231
8.26 Relationship between income and housing expenditures in Arak 233
8.27 Land and housing increase in medium size cities in 1992 234
8.28 Estimate of income distribution in Mohajeran new town 234
8.29 Dwelling types in Mohajeran new town based on housing affordability 235
9.1 Evaluation of infrastructure provision: Examples of objectives and implementation procedures 258
9.2 Examples of performance criteria, targets and data requirements for infrastructure provision in terms of simplicity and flexibility 259
### LIST OF FIGURES

1.1 Map of Iran: administrative divisions by province and location of cities cited in text 5

2.1 Cities near which new towns have been planned, 1991 49

3.1 Trend of Iran's population, 1900-1991 57

3.2 Population growth in Iran by total and urban area, 1900-1991 59

3.3 Migration within Iran, 1976-1986 60

3.4 Density pattern in new dwellings by storeys in urban area, Iran 67

5.1 Flow Chart of Urban Land Development in Iran, 1985-1990 103

5.2 Simplified diagram of user-pays system in Iran 108

5.3 Expenditure, user-payment and balance by different sizes 116

5.4 Total Balance of all projects by different size and year started 120

5.5 Expenditures and user-payments of all Projects, 1985-1991 121

5.6 Trends of real expenditures and user-payments in Baghmisheh-3 126

5.7 Trends of real expenditures and user payments in Darreh Mirabad 127

5.8 Trends of real expenditures and user-payments in Honarestan 127

5.9 Number of residential plots distributed by the ULO 130

5.10 Real land price and infrastructure costs in Iran, 1982-1991 131

6.1 Location of Arak in relation to administrative boundaries 138

6.2 Population growth in Arak during four official censuses, 1956-1986 141

6.3 Physical expansion trends for Arak 146

6.4 Land use in existence in 1966 (%) 148

6.5 Location of the Industrial Zone and Industrial Town in Arak 150

6.6 Unplanned expansion of Arak 152

6.7 Land use in existence in 1985 159

6.8 Land use proposed for 1995 159

7.1 Population, households and dwellings during 1967-1986 167

7.2 Housing indicators in Arak, the Province and Iran in 1986 168

8.1 Location of new land development projects in Arak 190

8.2 Location of Mohajeran new town 192

8.3 The Gerdoo Project 195

8.4 Plans of the "102-Hectare Project" showing different densities 201

8.5 Number of families received land from the ULO in Arak, 1982-1990 215

8.6 Expenditure, user-payments, and balance in Arak projects up to 1992 224

8.7 Trends in real expenditure and user-payments in "70-Hectare Project" 229

8.8 Trends in real expenditure and user-payments in Gerdoo Project 229

8.9 Trends in real expenditure and user-payments in the "16-Hectare" 230
LIST OF PLATES

6.1  The unplanned Football area in Arak 153
6.2  The unplanned Football area in Arak 153
7.1  The unplanned Cheshmeh Mooshak area in Arak 182
7.2  The unplanned Football area in Arak 186
8.1  The "70-Hectare Project" in Arak 200
8.2  The Gerdoo Project showing the pressure of physical expansion 200
8.3  The Gerdoo Project 211
8.4  A view of the Gerdoo Project in Arak 212
8.5  The "102-hectare Project" in Arak 219
8.6  The "102-hectare Project" in Arak 219
ABBREVIATIONS AND GLOSSARY

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>Bank Markazi Iran (Central Bank of Iran)</td>
</tr>
<tr>
<td>DHA</td>
<td>Department of Housing Affairs</td>
</tr>
<tr>
<td>EHD</td>
<td>Economic Housing Department</td>
</tr>
<tr>
<td>HDSC</td>
<td>Housing and Development Service Corporation</td>
</tr>
<tr>
<td>MARKAZI MHUD</td>
<td>Office of the Ministry of Housing and Urban Development in the Markazi Province.</td>
</tr>
<tr>
<td>MARKAZI PBO</td>
<td>Office of the Plan and Budget Organisation in the Markazi province.</td>
</tr>
<tr>
<td>MCDC</td>
<td>Mohajeran City Development Corporation</td>
</tr>
<tr>
<td>MDH</td>
<td>Former Ministry of Development and Housing</td>
</tr>
<tr>
<td>ME</td>
<td>Ministry of Energy</td>
</tr>
<tr>
<td>MHUD</td>
<td>Ministry of Housing and Urban Development</td>
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<tr>
<td>NCDC</td>
<td>New Cities Development Corporation</td>
</tr>
<tr>
<td>PBO</td>
<td>Plan and Budget Organisation</td>
</tr>
<tr>
<td>SCI</td>
<td>Statistical Centre of Iran</td>
</tr>
<tr>
<td>UARC</td>
<td>Urban Planning and Architecture Research Centre</td>
</tr>
<tr>
<td>ULDO</td>
<td>Urban Land Development Organisation</td>
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<tr>
<td>ULL</td>
<td>Urban Land Law</td>
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<tr>
<td>ULO</td>
<td>Urban Land Organisation</td>
</tr>
<tr>
<td>UWLOAL</td>
<td>Urban Waste Land Ownership Abolition Law</td>
</tr>
<tr>
<td>Bayer Land</td>
<td>Currently unused land, but with a previous history of development.</td>
</tr>
<tr>
<td>Dayer Land</td>
<td>Developed land</td>
</tr>
<tr>
<td>Mavat</td>
<td>Waste (virgin) land with no background of development.</td>
</tr>
<tr>
<td>Vaqf Land</td>
<td>Land dedicated forever as a pious gift and divestiture of the right of possession, owned by a religious organisation.</td>
</tr>
</tbody>
</table>
Chapter One

INTRODUCTION

This study examines the process and effectiveness of the new urban residential land development policy in Iran that was initiated in 1985 after the revolution. Increasing population growth over the last two decades has led to rapid urban expansion all over the country, creating major demands for residential land, housing and infrastructure, particularly in larger and medium sized cities. Areas of particular national concern addressed by the new policy are: finding the most appropriate patterns of residential land supply, and solving problems of basic infrastructure provision. The broad aim of this research is to address the formal (or official) process of developing land for new residential urban areas in Iranian provincial cities and, in particular, to examine policy outcomes against declared government objectives. Such post-policy assessment is a key element of the urban and regional planning process in most 'First World' states that is rarely attempted in developing countries and has not yet been examined in this context in post-revolutionary Iran.

The first section of this introduction discusses the background to the residential land development problem in Iran and presents the chief reasons for undertaking the study. The second section covers study objectives, an hypothesis and several specific research questions, as well as outlining research methods used and key sources of data. The last section provides an overview of thesis structure and contents.

1.1 The nature of the residential land development problem in Iran

Iran, like many other developing countries, has experienced high population growth and rapid urban expansion over the last few decades. Though continuing population growth has been a major problem throughout most neighbouring Middle Eastern and
African regions, the annual growth rate in Iran is one of the highest. From 1976 to 1986 it reached 3.9 per cent at its peak, resulting in a total population of 49.4 million by 1986. Estimates of future growth suggest totals of 89 million and 134 million by the years 2006 and 2021, respectively (Zanjani, 1992a:39). The World Bank has alternative figures and has estimated that the population of Iran will reach 78 million and 166 million by the years 2000 and 2025, respectively (World Bank, 1992a:269) (further discussion on national population is presented in Chapter Three).

Trends in urban population growth relative to the country's overall population are even more spectacular. In 1956, the year of the first national population and housing census, 31 per cent of the population was living in urban areas and this figure increased to 38 per cent in 1966. During the last decade before the Islamic Revolution of 1979 the urban proportion of the population increased to 47 per cent. The urban population growth rate then climbed to 5.4 per cent between 1976 and 1986 and the proportion living in urban areas reached 54 per cent in 1986. The future increase in the proportion of population that lives in urban areas is also of concern, as it is expected to reach 69 per cent and 74 per cent by the years 2006 and 2021, respectively (Zanjeni, 1992a:39).

Apart from natural population growth, rural-urban migration has been the main contributor to rapid urbanisation. Between 1966 and 1976 some 40 per cent of urban population growth was the result of migration from rural areas. From 1976 to 1986 the overall rate of urban population growth was six per cent, whereas for centres with less than 5,000 inhabitants it was only two per cent (Zanjani, 1990:59, Nazari, 1989:150). Internal migration figures for the most recent period covered by official records (between 1976 and 1986) showed, as might be expected, that the highest component related to the movements from rural to urban areas (MHUD, 1990:4) (the issue of rural-urban migration is elaborated in Chapter Three).
In the housing sector there are several factors underlying urban expansion in Iran. These include the rate of housing production, patterns of housing density and the amount of living space available per dwelling. From 1976 to 1986, the annual growth of housing commencements was 4.4 per cent, whereas the household growth rate was only 3.9 per cent. During this period the housing stock in the country increased from 2.3 million to 4.6 million units (Zanjani, 1992b:3 and MHUD, 1992a:7), representing a doubling in ten years. A second factor concerns emerging patterns of housing density, providing another way of looking at the physical expansion of Iranian cities. In 1982, more than two-thirds of units constructed were one-storey dwellings (67.7 per cent) while 27.5 per cent were two-storeys, and only 4.8 per cent were three-storeys or more (MHUD, 1992a:11).

In the urban areas the scale of development problems arising from rapid expansion have been exacerbated not only by the increase of the population (both from natural and migratory causes), but also as a consequence of post-revolutionary urban land policies. Arguably, the most important factor contributing to mass housing production at the scale noted above was the change brought about in urban land policies that resulted in a massive increase in land supply. These policies gave the government power over compulsory land acquisition with the result that large amounts of urban land came into public ownership at relatively low cost. The post-revolutionary Urban Land Organisation (ULO) was then responsible for distributing residential lots to applicants. A key challenge was to give them access to developed land (land with associated services rather than to allow haphazard and unserviced expansion). The public sector initially assumed responsibility for providing all basic infrastructure for the new residential areas, in common with standard practice in many other developing countries (see Drakakis-Smith, 1995; McAuslan, 1992).
However, for a variety of reasons, public involvement in infrastructure provision was found to be very expensive, of low quality, and subject to extensive delays\(^1\). In addition, there was an evident lack of co-ordination and sharing of information between relevant government organisations. Each infrastructure item tended to be executed at different times, creating extra work and duplication on every occasion. For example, water reticulation was often provided after road construction which resulted in completed roads being broken up. Furthermore, the government had a tendency to only execute projects when there were enough applicants to make them economically viable, thus causing extensive delays.

A haphazard pattern of development would result in many social, political and economic problems. New urban areas were likely to be characterised by spreading shanty towns formed largely without basic services. Examples of these areas appeared in many cities, such as in Ahvaz and Kerman (see Figure 1.1), and there was a very real threat that all new Iranian urban residential districts were set to become little more than shanty towns. While some factors responsible for this were unavoidable, such as a shortage of construction materials and personnel due to the ongoing war between Iran and Iraq, many could be traced directly to the absence of a focused national policy concerning land supply and infrastructure provision.

The government began tackling these problems in 1985 realising the seriousness of unchecked rapid population growth and uncontrolled urban expansion. In view of the negative changes occurring in Iran's cities, the question of how to create a decent, safe and healthy residential environment became a top priority of the Ministry of Housing and Urban Development (MHUD). In 1985, a new measure was initiated by MHUD to redress the absence of coherent policy. The Ministry announced that in the present policy vacuum the area occupied by Iranian cities would see a doubling in 20 years and to prevent this it would be necessary to

---

\(^1\) Based on the author's experience in working for the MHUD and ULO from 1982 to 1991.
Figure 1.1 Map of Iran: administrative divisions and location of cities cited in text

Source: Redrawn by the author based on SCI (1992c).
prepare effective plans to manage the introduction of new urban areas (MHUD, 1991a). Two separate policies were introduced in 1985 to address the creation of new cities (Shahrhayeh Jadid in Persian) through, first, establishing a new cities development corporation (Sherkat-e Omran-e Shahrhayeh Jadid) and, second, implementing new urban land development measures (Tarhhayeh Aamadeh Sazi-e Zamin) by establishing a special new office in MHUD (Daftar-e Tarhhayeh Aamadeh Sazi-e Zamin).

The new cities policy (Siasat-e Shahrhayeh Jadid) was introduced in order to respond to the tremendous increase in population of the largest cities (see Table 2.2). It was also designed to meet the requirements of the newly established industrial projects. It had a broad set of objectives addressing a wide range of issues, including those of economic viability, environmental concerns, social objectives and management strategies. Between 1985 and 1992, some 21 new cities were planned by means of this policy measure near 13 existing centres in places such as Tehran, Esfahan, Tabriz, Mashhad, Arak and Bandar Abbas (Figure 2.1). One positive objective of establishing these new cities was sought in the reduction of urban population growth elsewhere. In the First Five Year Plan (1989-1993), for instance, it was proposed that about 11 per cent of total urban land demand in Iran would be supplied in these new cities.

As with the new cities policy, the new urban land development policy also had a set of broad objectives. These concerned the provision of improved infrastructure, economic viability, management, and environmental and social impacts (Table 1.1). From 1985 to the end of 1992, over 37,000 hectares of public land covered by this policy were distributed to applicants. The scope was impressive, being spread over 440 projects dispersed across the country in 223 cities. It was projected under this policy that in the period of the First Five Year Plan over 1.5 million dwelling units would be built in new urban land development projects (MHUD, 1990:19).
Table 1.1  Aims of Iranian Urban Land Development Projects*

<table>
<thead>
<tr>
<th>Aims</th>
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<tbody>
<tr>
<td>1  To regulate the executive management of the urban development projects;</td>
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<tr>
<td>2  Participation of people in making their personal and collective environmental lives both by investing their capital and by building and profiting (the principle of people partnerships);</td>
</tr>
<tr>
<td>3  To supply public services from people management and capital investment;</td>
</tr>
<tr>
<td>4  To economise and eventually to eliminate the governmental expenditures in the urban services section and to direct this capital toward education and production;</td>
</tr>
<tr>
<td>5  To direct the replacement and settlement of the population and prevent the establishment of poor hut settlements (with consideration given to the population growth);</td>
</tr>
<tr>
<td>6  To create equilibrium among the dwelling houses;</td>
</tr>
<tr>
<td>7  To provide land on a large scale in reply to the society's need for housing;</td>
</tr>
<tr>
<td>8  To expand towns according to previous studies and to provide suitable land for residential application;</td>
</tr>
<tr>
<td>9  To prepare a suitable field for the activities of the private section in housing construction on the project land;</td>
</tr>
<tr>
<td>10 To prevent the agricultural lands and gardens from becoming residential and industrial areas;</td>
</tr>
<tr>
<td>11 To prevent economic stagnation resulting from the decrease of construction activities;</td>
</tr>
<tr>
<td>12 To create jobs;</td>
</tr>
<tr>
<td>13 To prepare a safe residential shelter from the viewpoint of urban development, architecture, infrastructure installations, urban services and upper installations;</td>
</tr>
<tr>
<td>14 To prevent the irregular and spontaneous expansion of towns;</td>
</tr>
</tbody>
</table>


Several means of achieving the official objectives were followed. Firstly, Iranian government policy makers introduced new regulations and action programs aimed at assisting urban land development policy, such as Article 11 of the Urban Land Law of 1987 (ULL) (Qanoon-e Zamin Shahri) and Article 41 of the Cabinet Regulation (Aiin Nameh-e Ejraii), which clearly dictated the way development was to take place in the new urban areas (see Chapter Five and Appendix 1 for further details).

A key regulation was that which banned any land distribution by the ULO that did not include basic infrastructure provision (see Guidelines for Land Development, in Appendix 1). This resulted in the call for a new pattern of development to take place...
where all new urban land areas were to be developed before the houses were built. These policies showed a growing acceptance of the need for the state to concentrate on wider urban issues in its decision making. A major omission, however, was any indication of how success, or otherwise, in meeting the declared objectives might be assessed after implementation had taken place.

The list of policy objectives (Table 1.1) gives no indication of priorities, nor are they grouped into fields of associated concerns. Indeed, the impression is given that little or no thought had been given to the way outcomes could be monitored in future years. It is easy, of course, to make such criticism from outside the policy-administrative process but it is hard to justify the value of including objectives of any kind unless post-implementation experience can be measured in some useful way.

The new urban land development policy presents a considerable challenge to Iranian urban planning as a whole and urban land development in particular. Its importance has been reinforced in a series of annual seminars held by MHUD at the national level since 1987. In these seminars all new plans prepared for the year are displayed and discussions held amongst local scholars, consultants, governmental officials and experts (the public could also visit and participate in discussions, but there has not been specific program to recognise a popular participative view). Additionally, an international conference entitled "Urban Development and New Towns" was held in October 1993, in the city of Esfahan, at which over 150 papers were presented by Iranian and international scholars. However, the new set of urban land development strategies has not yet been the subject of extensive or independent study. Examination of the effects of the policy on controlling the pattern of rapid urban expansion or in meeting its declared objectives has been largely neglected. Previous attempts at any form of analysis, such as the study by Mowlazadeh (1991),

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2 There are no published proceedings of the seminars for the initial years. However, since 1988 annual proceeding are published.
were largely limited to the examination of urban land policies rather than urban land development policies.

The main differences between the present study and the very few conducted previously relate to the inclusion of key issues of infrastructure provision and environmental control. The study by Mowlazadeh (1991), for example, examined post-revolutionary urban land policies focusing on popular participation, the Islamic economy and organisation, using the city of Ahvaz as a case study. The methodology employed was through a field survey focusing on the applicants' capacity to pay for land, as well as on an analysis of the Urban Land Organisation (ULO) from its legal, financial and personnel points of view. The process of land development (infrastructure provision and environmental issues in particular) were not, however, examined in his study3. On the other hand, as Table 1.1 indicates, the 1985 urban land development policy was initiated largely as a planning devise to cope with rapid urban expansion problems and was less concerned with ideological issues. Research for the government by consultants has also been undertaken, such as that by Arkolog and Ardam Consultants, and Haaery (MHUD, 1988b). They did not attempt a comprehensive examination of the policy itself but instead concentrated on a few specific issues, such as urban design. Most of their conclusions and recommendations are very generalised and do not provide specific feedback to policy makers of the kind proposed in this study.

Therefore, this study aims to provide the first detailed examination and assessment of the land development process in the new urban areas of rapidly expanding Iranian cities. In order to accomplish this it will be necessary to include a post-policy evaluation of a kind not attempted before in Iran and to access a range of land development project data that has remained untouched by researchers up to now.

3 In addition, a doctoral research by Majedi has been in progress for some time at University College London under the draft title “The Impacts of Post-revolutionary Land Policies on Housing in Iran”. It examines urban land policies mainly from an Islamic economy point of view and, again, has not dealt with infrastructure provision and environmental issues as outcomes of the new urban land development policy (based on an interview by the author with Majedi in Tehran in 1994).
Because the urban land development policy has been a major manifestation of government activity in urban planning and development, it provides a particularly good opportunity to increase the understanding of the gulf that can exist between policy objectives and the experience of actual implementation. The results will, hopefully, lead to new insights into changes in Iran that have occurred since 1985 and suggest some parallel relevance for urban management in other middle-range developing countries.

An additional reason for undertaking this research is a more personal one and concerns the special opportunity provided by my direct experience in urban development activities in Iran. I was involved for eight years (1983 to 1991) as an employee in several departments of the MHUD and the ULO, having spent the last four of them in the Office of Urban Land Development (*Daftar-e Tarhhayeh Aamadeh Sazi-e Zamin*). I participated in policy implementation through its various stages which included the consideration and deliberation of project agreements, approval of plans, as well as their execution. I also visited over 190 executed projects across the country (in all provinces) prior to undertaking specific fieldwork in Iran for this research from 1992 to 1994. Such direct experience has provided me with special insights that have proved to be an essential factor in undertaking the in-depth assessment of residential land development attempted in this study.

1.2 Study Objectives, Hypothesis, and Research Questions

*Study objectives*

As has already been indicated, Iran's urban land development policy is the first attempt of its kind in that country, in post-revolutionary times, to deal comprehensively with housing and urban land development. This study is designed to examine some aspects of what has actually occurred in implementing the new policy, and how it may have contributed towards an effective governmental
response to problems of rapid urban expansion in Iran. By revealing a better understanding of the urban land development process and its outcomes, this study aims to improve the quality of information available to policy-makers in Iran. The objectives are therefore to:

- analyse for the first time aspects of the scope and content of recent residential land development policy in Iran and the process by which it has been implemented; and
- assess the success of the policy regarding land supply, infrastructure provision and environmental issues in the new residential areas of Iranian cities, according to both official objectives and additional normative criteria.

**Hypothesis**

The question whether the new Iranian urban land development policy has been implemented according to its own declared objectives requires investigation. The set of 14 broad government policy aims appears in its presentation as a haphazard list, covering issues such as management performance, popular participation in financing and construction, provision of sufficient land and public services, private sector participation, protection of good agricultural land, and prevention of spontaneous urban expansion (Table 1.1). These official aims are imprecise as listed and so general in content as to prevent or seriously complicate an adequate post-policy evaluation of outcomes. Considerable simplification, plus the inclusion of missing features, like environmental considerations, are required to evaluate whether and to what extent the main objectives of the new urban land development policy have actually been achieved.

An adequate assessment of the new urban land development policy in Iran demands the introduction of a monitoring process and the inclusion of additional normative evaluation criteria besides the 14 official aims. McAuslan (1992) has categorised the principles involved into two orders: 'first order principles' which include, *muddling*
through, incremental change and fundamental reform, and 'second order principles' of (1) equity; (2) flexibility; (3) environmental consciousness; (4) participative and easy management; (5) simplicity; (6) efficient; and (7) administrative fairness. Adaptation and simplification of these second order principles is made here under the tripartite headings of (1) effectiveness; (2) equity; and (3) environment, for use in the proposed post-policy assessment of Iranian urban land development policy. Such an evaluative framework is selective, being designed to only cover key policy features of concern to government and the community that are capable of being accomplished in one study. For the same reasons original field investigations undertaken as part of the research are primarily limited to the provincial city of Arak. The three main assessment principles are elaborated as follows:

•  **Effectiveness** criteria (defined by the Macquarie Dictionary as 'serving to effect the purpose' and 'producing the intended or expected result') are employed to assess the provision of sufficient land to meet housing demands; the provision of adequate basic infrastructure in the key areas of water, electricity, roads, sewerage and drainage systems; and financial participation of people through their contribution towards the costs of development. It is likely that the task of providing sufficient land and services to all the new areas in Iranian cities will be extremely difficult for the government to achieve and, possibly, not even feasible. Many established urban areas already have difficulties in providing and maintaining key infrastructure elements. The new urban areas will probably be unable to provide and sustain basic services from government sources alone for many reasons. These include economic difficulties, scale of land demand and the general urgency to provide shelter that accompanies such rapid urban growth.

•  **Equity** criteria (defined as 'fairness' by the Macquarie Dictionary) are employed here in two ways: those bureaucratic initiatives used to evaluate various measures designed to conserve the expenditure of public funds, so they can be used

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4 Further discussion of these principles is found in Chapter Four.
to wider national benefit. With respect to the financing of infrastructure, for example, the MHUD initiated a user-pays system (in order to meet objective No. 4, Table 1.1). Equity is also considered from another perspective, that of the consumers, because a large majority of land applicants are low to middle-income people who could find it difficult to afford housing in a free market, or even one considerably subsidised by government.

- **Environmental quality** criteria are seen here in addressing the need to protect good agricultural land from excessive urban expansion, as well as providing basic infrastructure to overcome the 'brown'\(^5\) issues of urban pollution. The use of legislation and bureaucratic measures to cope with environmental problems is usually equivocal and ineffective. Therefore, sufficient knowledge of environmental degradation and environmental concerns is essential to curb the problems of the physical environment and can be seen as the 'brown agenda'.

**Specific research questions**

The introduction of an evaluative framework of the kind proposed is an essential first step in the government's assessment of urban land development policy in Iran. There are several specific research questions arising out of the hypothesis and its critique of the official list of policy objectives (Table 1.1) that will be investigated here:

1. To what extent has the new policy been successful in meeting demands for land supply and infrastructure provision in the new urban residential areas? This question is related to the effectiveness of the new policy in terms of objective No. 7 in Table 1.1.

2. To what extent (if any) has the government been able to eliminate or minimise public expenditure on basic infrastructure provision through an equitable and fair user-pays system (Objectives No. 2 and 4 in Table 1.1)?

\(^5\) Defined as the 'physical urban environment' such as energy and water provision, waste disposal and roads (see Drakakis-Smith, 1995 and World Bank, 1993).
(Under its present socio-economic objectives, the new policy aims to eliminate government expenditure on provision of urban services for new areas but says little or nothing about the effects of this on those applying for a building block).

(3) To what extent has the government been able to provide an environmentally appropriate living space in the new urban residential areas? For example, does the existing residential land development policy in Iran protect and enhance the physical environment through prevention of pollution and the preservation of good agricultural land, whilst providing vital infrastructure elements such as power, water, sanitation and roads? (no existing policy objectives are present in this area).

(4) To what extent does the review of policy implementation in the chosen case study area (discussed below) suggest lessons for other cities in Iran and in middle-range developing countries facing similar conditions of rapid urban expansion?

1.3 Research method

This study employs a combination of various investigative techniques, using several data sources including library study, a case study, field work and data analysis. The research methods are outlined below, indicating the way in which the research questions will be answered. The type of data, the method of data processing and their sources are also specified in Chapter Five.

Case study method

A case study of the city of Arak is utilised in this study in order to permit an in-depth and comprehensive understanding of relevant urban phenomena. It allows an inside view of the issues investigated to be made and enables an initial understanding of policy implementation at the local level. Although evaluation of the new urban land development policy at the national level is important (as
explained in Chapter Five), the case study provides the major empirical focus of the thesis. As noted by Yin (1984:23), a case study is an empirical inquiry that:

- investigates a contemporary phenomenon within its real-life context; when,
- the boundaries between phenomenon and context are not clearly evident; and in which,
- multiple sources of evidence are used.

Ideally, an examination of the research questions contained in this thesis should include several Iranian cities out of the more than 223 places where the policy was implemented between 1985 and 1992. This, was not possible, however, owing to time and financial constraints. Nevertheless, with respect to the specific variables chosen for analysis, the city of Arak is considered to be characteristic of many other provincial centres in Iran. Arak is the capital of the Markazi Province (Figures 1.1 and 6.1) and was selected as an appropriate case study to show how existing policies and other related issues of land development can be analysed and evaluated.

This city was also chosen in view of the author's experience and familiarity with a variety of Iranian cities for two important additional reasons. Firstly, it has recently faced very rapid population growth, having one of the highest growth rates of all Iranian cities. Secondly, Arak is one of the most important industrial cities in Iran and is being developed as a secondary urban centre as a means of decentralising urban growth away from Tehran, the primate and capital city. This fact allows the study to investigate the impact of industrialisation on the city, an important factor affecting urban expansion.

**Key sources of data**

Several intersecting sources and instruments have been employed in this research inquiry. Data and other information for the thesis have been collected from both primary and secondary sources including government documents, consultants'
reports, interviews, questionnaires and field observation. The major source of statistics are documents recently collected but as yet unpublished by the ULO and the MHUD. These sources offer data on urban land development projects at both national and local levels. They detail project codes, project areas, dates of commencement, approval dates, data on consultants and contractors, cost of the provision of infrastructure both for the MHUD and the user, and design aspects. They were mostly available only as unpublished MHUD record sheets. In general, these statistics have not been utilised in previous research to the author's knowledge.

Until 1991, the 'Office of Land Development' within the Department of Housing Affairs (DHA) had the responsibility of recording all data on new land development projects through a computerised system. In 1991, however, the responsibility for implementation of the new plan was transferred to the ULO. As such, the ULO has been the responsible department for data collection since 1991. Therefore, some parts of data including reports on projects, related acts and regulations were collected from the files in the DHA. The most recent data, particularly data on the financial aspects, was obtained from the newly established section of land development in the ULO in 1992 and 1994.

An important point regarding financial data is that the ULO has been keeping records on a monthly basis. All provincial offices have had to up-date their data on land development projects and send this information to the central ULO. Therefore, all records are changed monthly. For the purpose of this study the period from 1985-1992 was selected for examination, marking the beginning of the implementation of new policy and the time of the first field trip.

Data collection on the case study involves both primary and secondary data including: census data, personal observation, semi-structured interviews with officials, and newspaper and documentary research. The unified provincial data collected on an annual basis provides a unique opportunity for this study to
investigate the effectiveness of the new policy at both national and regional (provincial) levels of development in Iran. General information and data on the socio-economic, housing and physical characteristics of the city of Arak were collected mainly from three consultants, *Arseh, Parhouse*, and *Hamoon*. Reports from the initial consultants for Arak's master plans, *Sazeman-e Maskan* and *Group-9*, were also collected from the MHUD and Arseh Consultants. Other data resources included Statistical Centre of Iran (SCI), the Department of Housing Affairs (DHA), Mohajeran City Development Corporation (MCDC), the provincial offices of the MHUD, the ULO, and the Plan and Budget Organisation (PBO). A large body of data on general aspects of the city and region, including regional studies on the economy, population, industry, housing, urban development and municipal activities, were provided by the provincial office of the PBO in Arak.

The actual observation of operations in Arak provided a further dimension to the data resources. Field work in Iran, including Tehran and Arak, was undertaken during two separate trips that together covered a period of five months, from December 1992 to February 1993 and from September to November 1994. Close observations of activities at the urban land development sites in Arak provided opportunities for understanding the actual progress of policy implementation. Informal conversations with various staff members in Arak were also found to be a useful method of collecting information.

Interviews and discussions with three groups of people were also conducted during field trips. These included top officials in the MHUD (Deputy Ministers in Housing Affairs and Architecture and Urban Planning), ULO officials, the Urban Planning and Architecture Research Centre (UARC), Department of Housing Affairs, and the Physical Planning Office, in Tehran. In Arak, interviews were conducted with the General Directors of the provincial offices of the MHUD and the ULO, and with other staff members and officials in the provincial PBO and Arak municipal council. The second group of people interviewed consisted of academics, mostly from the
Department of Urban Planning at the University of Tehran. The third group included experts from the two city consultancy firms, *Arseh* and *Parhouse*.

A semi-structured survey was conducted in Tehran and Arak incorporating issues canvassed from informal interviews. The questionnaire is in Persian and its translation into English is listed in Appendix 1. The primary purposes of the survey were to understand and explain the problems of rapid urban expansion in Iran, and the state's response to these contemporary problems in its methods of urban land development. Finally, the data and statistics on the timing of implementation of new projects in Arak and the effectiveness of the user-pays system, used in Chapter Nine, were collected by using questionnaires (see Appendix 4) which were distributed to the provincial MHUD and ULO offices in Arak during the second field trip in October 1994.

**Data analysis**

As noted above, this study includes a detailed investigation using both quantitative and qualitative methods of analysis (Misra, 1989; Miles and Huberman, 1984). However, it will rely heavily, in some parts, on statistical information. This statistical analysis involves an examination of primary factors influencing rapid urban expansion in Iran as well as evaluation of the effectiveness of the new policy in terms of land supply and infrastructure provision.

The rise in housing demand was the major factor causing rapid urban expansion in Iran and led to the initiation of new urban land development policy. An effective land supply indicates that the housing demand is being met. Through the assessment of the policy outcomes the success or failure of the policy implementation is recognised. In the evaluation of infrastructure provision, the major task undertaken was to measure the effectiveness of the user-pays system. The study has utilised the primary statistics and data including governmental expenditures (*Hazineh*) and user
payments (Daryaft Az Mardom). The term 'expenditure' refers to the costs of infrastructure channelled by the MHUD for the implementation of new projects, and the term 'user-payments' refers to the amount of money obtained from new residents. Using primary data the study has undertaken an in-depth statistical analysis in order to define the relationships between these two variables. The term balance is established in this study in order to indicate the proportion of user-payments to government expenditure. The analysis of the relationship between these variables led to some of the most important findings of the study. One of the findings is related to the issue of equity. There is a review of the alternative financing methods for infrastructure provision in Chapters Two and Four.

In terms of environmental quality control, two key issues are examined, including the protection of agricultural land and the provision of basic infrastructure. Rapid population growth has led to an immense expansion. This has resulted in the conversion of good agricultural land to urban areas and subsequent difficulties in the provision of certain infrastructural elements such as safe water, sewerage and drainage systems. The impact of the new urban land development policy formulation on these issues is evaluated through the assessment of the regulations and outcomes resulting from new policy. The final stage of research is the presentation of some implications for the future of new urban residential areas. A study based on Arak may help to foresee and prevent some of the problems of land development in other Iranian cities before they reach the degree of difficulty of the problems now found in Arak.

1.4 Structure of the Thesis

In addition to this introductory chapter, the thesis comprises eight chapters: -

Chapter Two examines the nature and factors influencing rapid urban expansion including the dynamics of urban growth and urban expansion. Population growth,
land and environment and, economic factors are discussed. It also examines the roles of government, policies and responses. The last section deals with the key themes for the critical study of residential land development, including land supply, infrastructure provision and environmental quality.

Chapter Three analyses demographic, urbanisation and housing data in Iran at the national level as the prime factors causing rapid urban expansion. Furthermore, it investigates the issue of urban development in both pre-revolutionary and post-revolutionary periods in Iran. Finally, it examines the critical period of urban land development in the immediate post-revolutionary period from 1979 to 1985, which led to the initiation of the new urban land development policy.

Chapter Four discusses the evaluation criteria and some necessary background to the two major issues; the process of infrastructure provision and the wider environmental considerations. It also examines the issues of effectiveness and equity criteria of the provision of basic infrastructure. The last section deals with some issues concerning environmentally sustainable development.

Chapter Five examines urban land development policy formulation since 1985 at the national level. It consists of two major sections. Because this study is the first attempt of its kind to assess the new policy, the first section of this chapter measures and identifies the changing patterns of the policy in Iran and examines the specificity of regulations and institutional administration. The second section consists of an assessment and evaluation of the effectiveness of land development policy implementation. Two major concepts, including effectiveness of cost-recovery for the provision of infrastructure based on a user-pays system, and land supply are examined.

Chapters Six, Seven and Eight deal with an examination of the topic at the case study level. Chapter Six presents the urban setting of the city of Arak. Growth and change are analysed in order to understand the factors affecting the expansion of the
city. These include some aspects of its history, population growth, function, economy and physical development and the characteristics of its residential areas. Chapter Seven identifies and examines more specifically the nature of the key problems of land development in Arak. Three problems are emphasised including housing pressure, land supply constraints and key infrastructure elements. Chapter Eight focuses on the impact of the new urban land development policy as an example of contemporary government response to land development pressures in Arak. More specifically, and in parallel with Chapter Five, it evaluates the impact of policy changes on two major issues including land supply and infrastructure provision at local levels.

Chapter Nine, the final chapter, highlights the implications of the study with respect to policy formulation and research in three areas of land supply, infrastructure provision, environment and discusses the findings from previous chapters. Alternatives to the present urban land development policy is also discussed. This is followed by a discussion on urban planning and Iran's urban land development policy. Finally, issues for further research are put forward.
Chapter Two

THE CONTEXT OF RAPID URBAN EXPANSION IN NEWLY INDUSTRIALISING COUNTRIES

2.1 The dynamics of urban growth and urban expansion

A crucial land development problem in developing countries has been the unprecedented expansion of cities, particularly in the last few decades. As a result of rapid urbanisation\(^1\), housing and infrastructure demands, combined with a lack of public facilities and inadequate urban management, have led to the most serious problems. Water shortages, electricity supply, schools, hospitals, severe pollution, rising crime and traffic jams are some examples of serious urban issues experienced in developing countries (see Choguill, 1994; Potter, 1985 and 1990; Renaud, 1981). Places like Cairo, Ankara, Istanbul, Calcutta, Bombay, Jakarta, Seoul, Kinshasa, Lusaka, Mexico City, Lima and Caracas are examples of large cities in developing countries with populations of over one million and with over 40 per cent of them living in slum areas and squatter settlements (Hardoy in Klaassen et al., 1981:54, and Yeung cited in Drakakis-Smith, 1986:100). Knight (1982:48), for example, points out that:

*City development in the industrialised nations in the next century will take the form of qualitative changes, rather than of expansion of people and territory as occurred in the first two centuries of the industrial and urban revolution. City development in countries that are becoming urbanised and industrialised will continue to occur very radically.*

Several factors, including rapid population growth and unfavourable economic conditions, make the transition from uncontrolled expansion to managed forms of

\(^1\) As a result of rapid urbanisation new terminology has been introduced in the relevant literature such as 'suburbanisation', 'reurbanisation', 'disurbanisation', 'world urbanisation', 'urbanisation in the core', 'urbanisation in the periphery' (Klaassen et al., 1981:16; Short, 1984:7-25; May, 1989)
urban development extremely difficult in the less developed countries. Low per capita incomes, low productivity, limited government revenues and ineffective implementation procedures constitute some of the worst problems (Drakakis-Smith, 1995:660). Three main determinants are distinguished here as being particularly significant in contributing towards rapid urban growth and expansion. These are: demographic, housing and land, and economic factors.  

A question of rapid population growth

Developing countries face serious demographic problems which the World Bank (1992a:25) has described as a "demographic watershed", now reaching "unprecedented levels" (see also Findlay, 1987:2). Natural population increase and rural urban migration are identified as the chief factors influencing rapid urban expansion. Whilst average annual growth rates in high-income countries were only 0.9 and 0.6 per cent respectively during 1965-1980 and 1980-1990, the figures for low and middle-income countries during the same period were 2.3 and 2.0 per cent (Table 2.1). Significantly, as the table shows, the recent demography of Iran is quite extraordinary and on average, its population growth rate has been higher than many other countries. A full discussion on Iranian demography is presented in Chapter Three.

Table (2.1): Average annual growth of population

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<tbody>
<tr>
<td>Low income economies</td>
<td>2.3</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Middle income economies</td>
<td>2.3</td>
<td>2.0</td>
<td>1.9</td>
</tr>
<tr>
<td>High income economies</td>
<td>0.9</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>World</td>
<td>2.0</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Iran</td>
<td>3.1</td>
<td>3.6</td>
<td>3.4</td>
</tr>
</tbody>
</table>


2 For a comprehensive review on the historical transformation of city function and geographical issues see Muller, P. (1976); Short (1984:7-25).
Underlying this reality is the fact that most of the world’s population lives in developing countries. In 1990 over 4.1 billion out of 5.2 billion people in the world lived in low and middle-income countries (see World Bank, 1992a:269 and United Nations Population Fund, UNFPA, 1992:2). Significantly, population growth is still increasing in developing countries, with the World Bank (1992a:269) estimating that the population of low and middle income economies will increase from 4.1 billion in 1990 to 4.9 billion in 2000. Another estimate shows that some 90 per cent of world population growth will be located in developing countries by the end of this century (Rogers, 1982:486).

Whilst the total population in developing countries is growing rapidly, the urban population is growing twice as fast. The proportion of urban population in low and middle income countries was 24 per cent of global population in 1965, but had increased to 44 per cent by 1990 (World Bank, 1992a:279). The annual change in the percentage of the population that is urban, which is the most common measure of the rate of urbanisation, grew from 16.7 to 28.0 per cent in developing countries between 1950 and 1975 (Preston in Gugler, 1988:12). According to the World Bank (1992a:279), the proportion of urban to total population in the low and middle-income countries increased from 24 in 1965 to 44 per cent in 1990. Or, put another way, between 1950 and 1970 the urban population of developing countries grew by 137 per cent, while it was only 57 per cent in the more developed nations (Rogers, 1982:486). Slater (in Drakakis-Smith, 1986:8) points out that:

*Increase of the urban population, whether viewed in isolation or together with smaller increase of the rural population, denotes a process of urban growth. In contrast, urbanisation, in a demographic sense, is defined as a process of*

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3 For a discussion on the reasons for urban expansion in developed countries such as impacts of industrialisation, economic growth and technological advances, "baby boom" and governmental encouragement for housing in suburbs see, Rothblatt and Garr (1986:2); Henderson (1988:29); Gugler (1988:19).

4 See also Amos (1992:56); Rogers (1982:486); Herbert (1979:11); and Slater in Drakakis-Smith (1986:9).
growing population concentration whereby the proportion of the total population which is classified as urban is increasing.

An analysis of the reasons for urban population growth is not the primary focus of this study. However, three factors contribute most towards urban population growth: natural increase, migration, and absorption of rural areas into urban areas. As a result of the diffusion of medical knowledge, improvement of health care, the spread of health services, and an increase in life expectancy, the natural population growth rate has risen, particularly in recent decades. The world annual population growth rate reached 2.1 per cent between 1950-70, the highest rate in history, mainly as a result of medical technology (World Bank, 1992a:25). Controversy exists regarding the respective effects of natural population growth or rural-urban migration on urban growth. Davis (cited in Rogers, 1984:286-293) has suggested that natural population growth is the prime factor in urban growth, but Todaro (cited in Rogers, 1984:286-293) has suggested that growing migration is more influential than natural increase. Rogers (1984:286-293) argues that migration is a factor influencing the level of urbanisation, but natural population growth is the prime factor causing urban growth. He also points out (1984:268) that:

Although a sharp increase in the rate of rural-to-urban migration temporarily raises the urban population growth rate, its ultimate effect is to urbanise the population more rapidly and thereby to depress the urban growth rate to a lower level than it would have reached in the absence of the increase.

Nevertheless, rural-urban migration is one of the most important sources of urbanisation and, as the World Bank (1991b:18) states, "no country has been effective in restraining rural-urban migration". Massive rural-urban migration can be found in the cities of Calcutta and Madras in India, for example, where one in four of the inhabitants are rural migrants, as well as similar characteristics in Shanghai, Cairo and Mexico city (Zanjani, 1992c:6). Overall, migrants are attracted by employment opportunities and the higher level of income available in urban areas (Jansen in

5 For figures on migration in more developed countries, see Rogers (1984:268 and 1982:483); and Gugler (1988:14).
Klaassen et al., 1981:36-37). The decline of employment in the agricultural sector, changes in the traditional methods of agriculture to mechanisation, the increase of employment in the industrial and service sectors and discrepancy between the provision of social services and availability of housing in rural and urban areas are specific reasons for the absorption of rural population by cities, resulting in higher rates of population growth in urban areas (Drakakis-Smith, 1981:10).

One-third to one-half of the population of the Middle Eastern cities, particularly those located in Turkey, Iran, Saudi Arabia and Iraq, were originally rural-urban migrants (Richards and Waterbury, 1990:265). Apart from economic incentives, one of the major factors influencing extensive rural-urban migration in the Middle East is related to its geographical conditions. The semi-arid geographical environment has made rural life precarious. One of the consequences of this situation can be seen in the steep urban hierarchy. For example, not only are the capital cities, such as Cairo and Tehran, among the largest cities in the world, but the provincial cities such as Esfahan, Shiraz and Mashhad in Iran, are also strongly primate within their own provinces (Costello, 1977:39).

Redefinition or reclassification of cities because of changes to their boundaries is another factor contributing towards an increase in the level of urbanisation and the total urban population. In Iran, for example, where many cities are surrounded by villages, this phenomenon has caused a serious problem for demographic research (Zanjani, 1990:40). Between 1956 (date of the first national population census) and 1986 (the most recent one) there have been significant differences in total population of both urban and rural centres. These included changes in the definition of urban centres6, and the creation of small towns by combining several rural centres and changes made to centre names. For example, the number of rural centres in the Markazi province, in which the city of Arak is located, reduced significantly from

6 Until 1986 urban centres referred to places with population over 5000 inhabitants. Since 1986, however, urban centres referred to those areas which had a municipal council.
5075 to 1527 between 1966 and 1986. To redefine new boundaries for cities, a special program called "study of population transition in Iran" (Motaleat-e Tahavvol-e Jamiiat -e Iran in Persian) has been in progress by the Ministry of Housing and Urban Development (see Zanjani and Mansouri, n.d., pp. 1-7).

Residential land and urban development

Housing is one of the key elements contributing towards rapid urban expansion all over the developing world. The term 'housing' covers a broad range of issues, including planning, production and construction, financing, affordability, preservation, allocation and legal affairs. Chief inputs to the flow of housing services are production relations, physical facilities, capital investment, labour, land and location, and environment. The main outputs concern aspects of shelter, equity, satisfaction, status, environment and accessibility (Bourne, 1981:15).

Housing 'needs' are defined broadly, ranging from shelter required by a new population, to those whose housing is substandard, or those whose dwellings require improvement or replacement (Ward cited in Van Vliet, 1990:413; Hardoy and Satterthwaite, 1981). The rate of housing production in particular has a direct relationship with urban expansion and development. Residential areas cover a large amount of urban space, amounting from 35 to 45 per cent of the land area of most world cities (Bourne, 1981:19 and 126). In Iran, residential areas cover between 30 to 40 per cent in most master plans. According to the standards considered by the Ministry of Housing and Urban Development in new urban land development projects, residential areas cover some 40 per cent of total land (MHUD, 1989b:58).

Ensuring adequate land supply is a key factor in coping with the needs of effective urban land development. As noted in Chapter One, post revolutionary urban land development policies in Iran were initiated via public land ownership. Therefore, it is
important to also consider various aspects of land ownership here, though this is a complex concept that includes economic, legal, political and cultural aspects.\textsuperscript{7}

The effects of land speculation have also a major role in determining land supply. The chief reasons for speculation are well known, with undeveloped land being taken off the market for owners to speculate on its later higher development value. Private landowners may withhold land in expectation of higher benefits in the future, leaving vacant and undeveloped land within built up areas. Speculation can be an obstacle in the provision of land for housing as well as for infrastructure and public facilities. Neutze (1987:379) argues that scattered development occurs when vacant land located at the fringe becomes an obstacle to timely development, with a consequent increase in the adjacent land price (see also Archer, 1973:367; Clawson, 1962:105; Rodridge-Bachiller, 1986:79). When the proportion of vacant land increases, urban sprawl becomes much more extensive. Examples of the adverse effects of vacant land on land prices are seen in cities such as Buenos Aires, Tehran and Tel Aviv (Darindrakkin, 1977:81). In Iran too, land speculation was a major problem prior to the initiation of the post-revolutionary land policies similar to other capitalist countries. These policies will be discussed later in this chapter and Chapter Three (see also Mowlazadeh, 1991).

Land supply is also affected by a group of institutional, legal, administrative and bureaucratic problems. The centralisation of power, the nature of legal systems, traditional authority, property rights, and tenure systems, all play a major role in determining effective land supply. Chief among these factors, are problems regarding land use regulations, including outdated regulations, excessive time taken in the preparation of master plans, their failure to address implementation issues, excessive centralisation, lack of co-ordination, and the process of control, all leading to delays in land supply (Farvacque and McAuslan, 1992:63). For example, the Urban Land

\textsuperscript{7} For a discussion on the history of land ownership see Powelson (1988:5-9).
Ceiling Act of 1976 was passed by parliament to control land speculation in India, giving rise to a large informal market in land. While zoning and tight boundaries have been used as tools for urban development control, their regulation can stem the supply of needed land in the urban fringe (Peiser, 1989:201). Many of the above mentioned factors affecting land supply also exist in Iran which will be discussed later in this chapter as well as in Chapters Three and Five.

The third issue placing a constraint on supply is the use of land for agricultural purposes. Historically, there has been a perceived conflict between the demands of urban development and that of agriculture. Among the difficulties arising from this are the loss of adequate food supply, loss of agricultural employment, and the creation of various environmental problems. Furthermore, since speculation by the private sector has been a major obstacle to the supply of sufficient residential land, the conversion of agricultural land for urban uses becomes one of the main ways of meeting land demand (Darin-Drabkin, 1977:405).

Customary land tenure operates under traditional systems of land allocation and is an important issue affecting urban development and expansion in many developing countries. This type of tenure is particularly important in the Pacific region, in countries such as Papua New Guinea and Fiji. In Papua New Guinea, for example, 97 per cent, and in Fiji 83 per cent of total lands are held under this tenure system. Lea (1983:61-66) argues that in Papua New Guinea, where three quarters of urban development has been associated with residential uses, problems can arise from uncoordinated development and confusion about tenurial rights, leading to squatting. In addition, it may be only members of a given group that have tenurial rights in the case of customary tenure. In Port Moresby this is highlighted by the circumstances of

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8 The conversion of agricultural land into urban areas has been a problematic issue even in countries with small populations, low population growth rates and large areas, such as Canada and Australia (see Bryant et al., 1982:99; Countryside Commission, et al., 1981:101).
settlers who may be forced to live at the urban periphery even though other customary land in the urban area in the ownership of urban villagers remains undeveloped.

An example of customary land ownership in the Middle East region is *vaqf* land which is a well known property term in countries such as Iran, Iraq, Egypt, Jordan, Turkey and Lebanon. The nature of *vaqf* is the dedication of land forever as a pious gift and divestiture of rights of possession. *Vaqf* property is dedicated to God by the owners and its income allocated to religious or charitable purposes, such as maintenance of religious buildings or the support of the poor (Beaumont, et al., 1988:148). Governments have regulated *vaqf* by establishing special agencies, such as Vaqf Organisation in Iran (*Saseman-e Oqaf* in Persian). *Vaqf* land is an important issue in relation to urban development in Iran as seen in a sub-article in the Urban Land Law of 1987 (Sub-Article 3 of Article 10), which states: "... the allocation of *Vaqf* lands must be in accordance with urban development regulations and with respect to their bequeathals' views". An example of this can be seen in the case study examined in this thesis. Whilst the initial area of a new land development project was 79 hectares, 9 hectares of *vaqf* land was deducted with the result that only 70 hectares was left for development by the MHUD. The 9 hectares of *vaqf* land was allocated to relevant religious organisations to be developed under another set of regulations.

Optimal density patterns are also an important issue in relation to land supply. Density is influenced by many factors, including demographic, the economy, environment, as well as the character of the land itself. Among these factors are changes in family structure, resulting in an increase in land required per capita, an increase in income per capita resulting in an increase in space requirements, such as roads, parking and sports facilities (see Braby, 1989; Office of Local Government, Australia, 1988; Rodriguez-Bachiller, 1986:96; Herington, 1988:19). Because of environmental and economic concerns, the strategy of increasing urban residential...

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9 For the various definitions of density see Ministry of Housing and Local Government (1962:10).
density has received wide attention in many countries recently (see Larkham and Jones, 1993). A high demand for dwellings and need for strict controls over land availability, as well as the need to allocate more land for new roads, schools, hospitals, parks and sports grounds has largely led to this strategy. Wolffe (in Taeuber, 1972:28) points out: "If density is to be used as a measure of the quality of living, it has to be refined beyond raw numbers to consider the amount of habitable square space available to each inhabitant, and the quality of service." The relationship between density and land supply, economic aspects and environment are key themes of this study and will be examined in greater depth in the empirical chapters.

**Economic factors**

Economic factors also play a major role in the process of urban growth as a whole and urban development and expansion in particular. Structural changes in the national economy and transformation from agrarian to industrial societies are considered to be fundamental economic determinants of urban growth (Rogers, 1982:483; Mills and Becker, 1986:13). If the national economy faces changes for any reason, various sectors, including the urban, are affected. Economic recession in developing countries has been a significant factor influencing the process of urban growth found in Brazil, Mexico, Morocco and the Philippines in recent times (Gilbert, 1992:437). For example, the development of major urban infrastructure depends to a great extent on national priorities contained in government programs, as well as sufficient overall financial resources. The existence, or otherwise, of adequate roads, electricity, gas and water can be important factors in guiding the expansion of urban areas (Brotchie, et al., 1991).

There are many variations in economic circumstances of the developing countries, such as wide differences in the GNP per capita indicator that pose different kind of planning dilemmas (Drakakis-Smith, 1995:659). In terms of the role of national growth, Preston (in Gugler, 1988:15) argues that the higher the level of GNP per
capita, the faster the rate of urban growth. Two of the most important economic factors affecting urban expansion, those of industrialisation and employment, are selected for further discussion here. The main reason for selecting Arak in Iran to be the case study examined in this research, is because it is one of the most highly industrialised cities in the country.

**Industrialisation**

Many important issues concern the relationship between industrialisation and urban growth in developing countries, such as improvements in public transport and communications and the impact of rising car ownership on urban expansion (see Bryant, et al., 1982:113; Herington, 1984:18; Baross, 1992:45; Binford, 1985; and Badcock, 1984:87; Gugler, 1988:23; Brotchie, 1991:26). However, as already indicated, industrialisation in Arak was based on the objectives of a national growth centre strategy that began in 1960s (*Tamarkoz Zodai-e Sanati* in Persian). Because of its importance the impact of growth pole strategies on urban growth and expansion is considered further here.

Negative externalities of overcentralisation, such as congestion and pollution in large cities, as well as inefficiency in terms of regional allocation of investments, lead to decentralisation (Lo and Salih, 1978: xii). Concentration of industries in large metropolitan areas in large developing countries, such as those found in Brazil and China, has been identified as a major cause of ineffective regional development (Henderson, 1988:15, 157). Under conventional 'top down' policies, growth centres strategies were put forward which related directly to overall national development policies (Simon, 1990:6). In other words, the growth pole approach has been used to develop strategies for state decentralisation as a tool of public policy.

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10 Economic factors influencing cities are different in developed countries. For example, in the American context, as Knight (1982:179) points out, three major changes exist: the movement to a post industrial society; the internationalisation of the American industrial sector; and the irreversible increase in the cost of energy.
The strategy has been tried in Western Europe and the United States, as well as in many developing countries. Chief among the latter are South Korea, China, Chile, Venezuela, Brazil, India, Indonesia, the Philippines, Thailand, Malaysia and Iran. Among the positive contributions of the strategy are:

- improved access to services by their residents and those of surrounding rural areas;
- better provision of shelter and physical infrastructure to improve mobility and access to markets;
- promotion of agricultural diversification and the production of surpluses;
- stimulation of small-scale and labour-intensive industry;
- better utilization of local resources; and
- the retention of population who would otherwise migrate to large centres (Simon, 1990:6).

However, as might be expected from such widespread adoption of the policy, there are many different aims and implications (Henderson, 1988:152; Buttler, 1975). A negative example of growth pole strategy on city structure is found in the case of Ulsan City in South Korea. Although targeted development brought about some economic growth in the region, it also caused rapid urban growth and expansion, with many consequent problems. During the first twelve years of implementation of the strategy (1962-74), the annual population growth rate of Ulsan City reached 7.4 per cent and the main reason for this high rate was identified as in-migration. Key problems following industrialisation in South Korea were identified as an over dependency on overseas markets and the location of almost all plant headquarters in Seoul. Moreover, industrialisation of Ulsan City did not bring about any significant decentralisation of the Seoul population but reduced agricultural production in the region and also disrupted the environment (see Kim in Lo and Salih, 1978:71-77).

Another example of implementation of growth pole strategy is found in China during the development of industrial cities in the interior between 1949 and 1957. Whilst East Coast areas were traditionally the most developed region of China, exploitation
of mineral resources in the interior became the primary reason for development in the period between 1949-1957. Since 1958, population movements were generally restricted in China, and growth pole strategy itself was the cause of considerable intra-and interregional migration (Henderson, 1988:202).

**Employment**

Employment is another important issue in relation to urban growth. Rural-urban migration is a major source of urban expansion, and occurs mainly for economic reasons (Jansen in Klaassen et al., 1981:36-37). The rural sector in developing countries is the location of most of the nations poor, with the chief reason given for migration to the cities being better life prospects for most people. Characteristically, terms such as 'unemployment', 'underemployment' and 'misemployment' indicate the small contribution of full time labour to social welfare in much of the developing world (Gugler, 1988:75)\(^\text{11}\). In Iran, while the official rate of unemployment increased from 10.0 to 14.1 per cent between 1976 and 1986, unofficial sources report a rate as high as 28.6 per cent for 1986. Rural-urban migration was responsible for some 20 per cent of the job entrants in urban areas (Amirahmadi, 1990:187-188). Significantly, most of the new employment opportunities were urban-oriented. Between 1976 and 1986, for example, almost all the newly created private sector jobs (7.6 million) were service related and mainly located in urban areas. In the pre-revolutionary period, a study by Bahrambeygui (cited in Costello, 1977:43) also showed 72 per cent of migrants to Tehran came seeking a job or a better job. Similar examples can be found in Iraq, Turkey and Libya.

In the Middle East, in addition to the above mentioned factors, the oil industry has been a significant economic factor influencing urban growth by creating new

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11 In the context of the role of employment in urban growth and urban expansion in developed countries, such as Australia, Britain and the United States, see Minnery (1992:22); Herington (1984:24); and Hamill et al. (1989:16).
employment opportunities. Services became centred around oil resources and refineries, particularly in the initial years (early 1900s) when transportation technology was not sufficiently advanced to carry oil to the export market. In addition, political demand for nationalised oil companies has created local employment opportunities in the services sector (Drakakis-Smith, 1981:11; Turner and Bedore, 1979).

Middle Eastern oil production has had an impact on urban growth. When oil was first exploited on the eve of the First World War, the economies of some countries in the region became export-oriented. The growth of Kuwait is a good example of this. In 1907 its population was only 35,000 (almost all in Kuwait city), and reached 60,000 in the 1930s; 160,000 by 1952; 467,339 in 1965; and two million in 1990 before the advent of the Gulf war. It is estimated that the population will reach three million in 2000 and four million by 2025 (World Bank, 1992a: 269; Costello, 1977:34 and Al-Yemeni, 1986:28). Other examples are found in cities in the south west of Iran. In this region, where most oil production is located, existing towns have grown rapidly and some, such as the industrial city of Abadan, have been built as company towns. These places previously lacked any significant economic activity of an industrial kind and served only as centres for the new functions resulting from oil exploitation. Foreign technicians and administrators migrated to these cities in significant numbers, as well as large numbers of labourers from other regions of the country and, in the case of Abadan, Bakhtiari tribesmen from surrounding areas. Abadan was a small village and an unregulated settlement before the development the oil refinery. However, by 1937, its population increased to 60,000 and by 1956 it had over 226,000 inhabitants (Zanjani and Rahmani, 1989:24). The expanding oil companies provided almost all land and housing for their employees, as well as most services. Specific layouts for residential quarters were planned, mainly to settle foreign employees (Costello, 1977:25).
Just as oil exploration has been a factor influencing new urban settlements, the termination of oil production also affects urbanisation. The town of Masjed Solyman, located in the south-west of Iran, is one example. With the economy entirely based on oil production, it had a population of 70,000 in 1969, with all infrastructure and social facilities created for the purpose of serving the oil industry employees. After the termination of oil production in the 1970s, the population dropped to less than 40,000 by 1980 (Melamid, 1991:158). However, after the Islamic revolution, its population again increased, particularly because of massive migration from war-damaged places located close to this city.

**Environmental concerns**

The condition of urbanisation found in many developing countries forces an increasing proportion of the metropolitan population to live in squatter settlements or in slum areas\(^{12}\). In 1981, for example, there were 413 slum and squatter settlements in Bangkok in which 13 per cent of the total population of the city were living (Boonyabancha in Angel et al., 1983:255). In Bombay, in 1992, as many as 3.9 million people out of 11 million lived in squatter settlements and it is estimated that the total population will increase to over 15 million by the year 2000, with a commensurate increase in squatting. In Rio de Janeiro, in 1992, over 3 million out of a total of 10 million population lived in slum conditions on dangerous and eroded hillsides. In Cairo, which has a population of more than 9 million, thousands live in cemeteries known as the "Cities of the Dead" (UNFPA, 1992:16). In Africa, as the World Bank (1991b:37) has noted, less than half of the urban population in Zaire, for example, benefits from basic urban infrastructure. Over 90 per cent of public buses

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12 The term "squatter" is used here to describe an occupant who erects a dwelling without permission contrary to law. The term "slum" is used for legal dwellings which are substandard in various aspects such as subdivision and living conditions (Drakakis-Smith, 1981:43).
are out of service and only 20 per cent of telephone calls are completed (see also Linn, 1983:132; and Bernstein, 1972). 13

In Iran, many of the shanty towns 14 date from the immediate post-revolutionary period. As will be shown in the next chapter, the extent of slum areas in Iranian cities is much lower than in many other developing countries. However, many shanty towns came into existence because of mass distribution of public land in a short period of time since the revolution. It may be argued that newly constructed dwellings were adequate in physical terms as they possessed higher floor space. However they faced serious infrastructure problems, such as deficiencies in water and electricity supplies, roads and various public facilities (these issues are fully discussed in Chapter Three).

Much has been written about the values inherent in the provision of urban infrastructure and many ideas ranging from the general to the specific have been presented (see Ausbel, et al., 1988:9, 233; Feldman, et al., 1988; and Sharp, 1990:185). Kaplan (in Stein 1988:35), for example, points out that if infrastructure problems are not solved, a nation's economic productivity and quality of life will suffer. Beckmann (cited in Ausbel, 1988:98) claims: "Infrastructures are basic to all economic life... The study of infrastructure opens up an approach to whole class of economic problems". Ausbel, et al. (1988:3) argue that:

*Infrastructure is often in the foreground when we speak of the quality of life, and images of infrastructure, whether positive ones of aesthetic structures or negative ones of time spent waiting in queues, are central to our image of healthy cities and societies.*

13 For a discussion on the environmental problems in developed countries see Bieda (1991).

14 The term 'shanty towns' is used here to describe urban areas that suffer from the lack of basic infrastructure and public facilities even though dwellings may be adequate in terms of some standards such as construction quality and floor space per dwelling or per person.
Social issues

In the more developed countries, the movement of people from inner cities to suburbs usually occurs in order to discover the "good life", supposedly offered by the suburbs (see Bourne, 1981:134; Rothblatt and Garr, 1986:4; Goldberg in Batty and Hutchinson, 1983:32). Bourne (1981:134) categorises the chief factors causing this kind of residential mobility into four groups: (1) life style change (marriage, family size, retirement); (2) income and employment (changes in jobs and incomes); (3) housing attributes (better or more suitable conditions); and (4) neighbourhood and accessibility to job and public facilities. In contrast, the suburban areas of cities in developing countries are rarely distinguished in terms of income and can be the home of lower income groups. In these countries, quality of life is very much a problem related to poor economic conditions rather than urban location (Darin-Drabkin, 1977:28).

Cultural factors also contribute to settlement patterns. In the Middle East, for example, religion has had a major role in shaping the social structure of communities and affecting their physical form (see Tavernor and Connell, in Connell, 1970:21). Islamic cities share many common features in their social structure and physical forms (Costello, 1977:8; Carruthers, 1986:18). The Islamic culture presents a unique notion of social activities located in community places. In traditional community places there are masjid (mosques), madrasas (Islamic schools of higher education), shrines of holy people, bazaar (local markets), and husayniya (places where passion plays are performed) where various social interaction takes place.

15 In this context, relationships between concepts of welfare, income, living costs, land value and city size are other controversial issues. For example, according to Haworth, et al. (1978:1 and 1979:345), inequality increases proportionately to the size of cities. But, by contrast, Walker (1978:121-2) suggests that inequality may not be a result of increase in city size it may vary even within two similarly sized cities. Richardson (1973:54) argues that relationship between city size and income equality is indirect. He suggests that the level of equality is mainly determined by income level. Average incomes depend directly on city size, whereas incomes are positively associated with city size (see also Walker, 1979, 1981; Hirsch, 1982; and Nord, 1984).
The influence of cultural factors on the layout and characteristics of Iranian cities is best observed in traditional cities such as Esfahan, Qom, Kerman, Kashan, Yazd and Mashhad. The existence of numerous mosques and madrasas in Esfahan's bazaar area shows the significance of these religious places in the formation of the city centre (see also Costello, 1977:10 and 85; Blake and Lawless, 1980). The spatial order elaborated in Esfahan's centre and its components is a manifestation of the Islamic principle of 'unity' (Ardalan and Bakhtiar, 1973:123). Another example, the shrine complex of Imam Rida (the eighth Imam of shi'a Muslims) in Mashhad, is located in the heart of the city. The shape and functions of this complex determine the layout of all the other community places in the city centre. The concentrated form of the whole centre and orientation of each element towards the shrine complex shows the relationship between cultural elements and physical layout. However, following 'modern urban developments' (see Costello, 1977: 22), the structure and physical form of the Middle Eastern cities was largely influenced by western images (see for example, Al-Yemeni, 1986).

Cultural factors have also influenced on housing conditions, particularly on design and floor space. The tradition of preserving private life from the public is maintained in the society. Houses are set apart and surrounded by high walls. The concept of privacy also has resulted in separating a relatively large room for visitors. This has been an important factor influencing higher floor space ratio in countries such as Iran as will be indicated in next chapter (see also Costello, 1977:77).

2.2 Roles of urban government

Parallel to the emergence of rapid population growth, urban residential land development is one of the most crucial concerns for urban development as a whole. Successful policies on land supply, infrastructure provision and environmental considerations are vital for achieving the goals set by the urban development policies.
To overcome the problems and improve the availability of developed residential land a number of strategies have been initiated, such as public acquisition of land through confiscation and nationalisation, public-private ventures, voluntary bargain and sale, land pooling, urban consolidation, and new town policies (Kitay, 1985: 13-37; Godschalk, et al. 1986; and Hallett, 1988).

However, as noted in Chapter One, the new urban land development policy in Iran was based on public land ownership as the major land tenure system after the revolution. Therefore, it is essential to examine various aspects of government intervention in the land market through public land acquisition. In addition, the land pooling readjustment strategy which was widely adopted to overcome the problems of land supply and infrastructure provision, is also examined here. As far as the literature indicates, this technique has not yet been attempted in the Middle East, nor in Iran, but it is useful to examine it as an alternative method of land development in contrast to public acquisition. Furthermore, beside urban land development policy, the Iranian new towns policy was also initiated to overcome the needs of population growth in large cities, as well as to meet requirements of specific industrial projects.

Public land acquisition

Government intervention to control land development has been adopted according to different principles and objectives in many developing countries. This includes, comprehensive management of growth; responding to social needs; environmental protection; provision of low income housing; and stabilising or decreasing the cost of residential land. In some countries, such as Algeria, Cameroon, Tanzania, Ethiopia and Zimbabwe, direct intervention by the public sector is utilised to eliminate the market in land through nationalisation. In this situation, two methods are commonly adopted. Firstly, land may be allocated administratively, as occurred in Algeria in 1979. The major objectives of Algerian land nationalisation were to meet increasing demand, reduce speculation, control urbanisation, and preserve rural land. Secondly,
land may be transferred through leaseholds, as attempted in Cameroon. Compulsory land acquisition is also found in many other developing countries, such as in India, Pakistan, Ghana and Colombia (Farvacque and McAuslan, 1992:70-74).

It has been suggested that the public sector should actively intervene in the land market to prevent and reduce the problems of developing new urban settlements (Darin-Drabkin, 1977:88). Whilst new urban fringe areas in developing countries continue to have high rates of land price inflation and lack vital services, it is considered essential to employ selective government intervention to resolve these problems. The following rationales are suggested by Roberts (1977: xiii), to support government intervention in land markets:

- public land ownership allows the government to manage and channel urban growth in a more comprehensive and rational way;
- government development allows the community to meet various societal needs (such as green space, environmental preservation, low-income housing) that regulation or taxation alone can not accomplish;
- government development can stabilise or decrease the cost of land for residential uses;
- government development can guarantee the automatic recapture of the increases in value flowing to urbanising land that is largely due to public or community expenditure.

However, there are many concerns in relation to nationalisation of land. In Algeria and Cameroon, for example, little has been achieved through nationalisation for reasons such as land wastage, a lack of accurate and complete information on land reserves and land transactions, as well as the lack of appropriate compensation. Furthermore, illegal transactions prosper because of major differences between government land prices and the free market (Farvacque and McAuslan, 1992:71). In Africa, nationalisation of land has also been tried in Tanzania, Ethiopia and Zimbabwe, where the governments wish to convert all private land to long term leaseholds. Kitay (1985:35) observes, however, that:
There is no evidence that nationalisation across the board has solved land-control problems in countries like Tanzania, Ethiopia, or Zimbabwe. Squatting and illegal land invasions appear to occur with the same frequency as in neighbouring countries where nationalisation laws are not in force. Indeed, the experience of countries that have nationalised all land demonstrates the essential weakness of public land acquisitions - it is not the acquisition per se that accomplishes useful purposes, but rather, the policies and procedures for land use that follow acquisition. While land acquisition permits positive control of land, it doesn't automatically carry out such control.

Public land ownership can also take place because of national religious principles. In the Maldives, for example, public land based on Islamic religion is reserved as a "free good" and "a gift of God". However, because of several problems, including the shortage of land in the island capital, Male, attitudes regarding land changed towards managing land as an economic resource in a way which had little or no relationship with Islam (McAuslan, 1992:16).

In Iran too, public land ownership has became a fundamental principle since the Islamic revolution of 1979. As already indicated, several urban land laws and regulations were initiated after the revolution in which a large amount of land came under public ownership. Most significantly, Article No. 9 of the 1987 Urban Land Law allowed the MHUD to acquire dayer land (developed or farm land) and bayer land (currently unused, but with a previous history of development) in 32 cities which were experiencing a land shortage. However, the implementation of this sub-article only took place for five years, and since 1992, although the rest of the law remained, the above mentioned sub-article was not extended. The main reasons for this may be seen in differences in attitude regarding compulsory land acquisition, as well as in many administration and institutional problems resulting from excessive bureaucracy. For example, distinction between the three types of land, dayer, bayer and mavat, could result in serious administrative problems, including claims by landowners (see
Since then, the government has compulsorily acquired only *mavat* land (waste or virgin land with no background of development).

**Land readjustment - land pooling**

The Land Pooling Readjustment Technique, a local planning and a joint public-private venture, is generally used to develop a variety of land parcels. It was introduced in Germany in the 19th century and later developed in many other countries (Mahesan and Shaari, 1990:11). This technique is based on a contribution by landowners to give a certain portion of their land to an implementation agency for development. The main idea behind Land Pooling is that it can create larger and more viable areas of land for development. Through this technique small or irregular lots, which have physical and environmental problems, are rearranged in a single and well arranged layout. Some 15-25 per cent of prepared land remains in public land ownership (for example roads and schools), 15-25 per cent is for the government to sell to cover services costs, and the remainder is returned to the original owners (Kitay, 1985:21).

Land pooling also has several other objectives, such as meeting the needs of low-income groups by allocating some plots for low-income housing within a layout. Another major objective of Land Pooling is the provision of urban infrastructure and public facilities. It is argued that by employing this technique, public sector expenditure on land acquisition and infrastructure implementation is reduced (see Archer, 1989:325; Doebele, 1982; and Larsson, 1993). Many rich and poor countries have adopted and implemented this technique as an alternative to other compulsory land acquisition methods. These include Japan, Germany, Australia, Canada, South Korea, Taiwan, Malaysia, Indonesia and Nepal (Doebele, 1982; Archer, 1989;

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16 For a comprehensive discussion on the philosophy of the post-revolutionary urban land policies, see Mowlazadeh (1991), particularly Chapter Three on Islamic economy.
Mahesan and Shaari, 1990:11). Some 30 per cent of total urban land in Japan and 77 per cent of Nagoya city has been developed using this technique (Habitat, 1987:52).

The strategy of land readjustment has been identified by some governments as well as scholars as an effective means of supplying land and one method of solving the problems of urban development under private land ownership at the local level. For example, Dato' Kamaruddin B. Mahmood (Secretary-General, Ministry of Housing and Local Government, Malaysia, cited in Mahesan and Shaari, 1990:29) argues that through the implementation of this technique: the public agencies involved do not have to search at length for the available land needed for public facilities; the project can be carried out based on a self-financing principle by recovering project costs from the revenue collected from the sale of the financial land. Consequently, it reduces the financial burden on the part of the government and the entire area is better integrated spatially. The project also encourages neighbourliness, community participation and spatial integration; and, it reduces land speculation and controls urban sprawl. Schnidman (cited in Mahesan and Shaari, 1990:177) also suggests "fostering a process of land readjustment will allow the more efficient use of property within a local authority's jurisdiction. It will help focus public resources on redevelopment projects which have a better chance of achieving public policy objectives, and it will expand the possible scope of redevelopment through cost-sharing with landowners."

However, there are several important issues to be considered in relation to the land pooling readjustment technique. As Farvacque and McAuslan (1992:70) have suggested, the existence of an appropriate legislative framework and effective detailed plans are prerequisites. It is also attractive only where the provision of infrastructure would be difficult to achieve through any other means, and where the demand for developed land is strong enough. Furthermore, the duration of a project must not be too long. Many prerequisites are also essential for the implementation of this strategy. These include the need for sympathetic government support; relevant legislation; well-trained personnel; and skilled negotiators (see also Kitay, 1985:27).
Non-adoption of land pooling readjustment in some countries may be considered as evidence of difficulties in achieving these goals. Bureaucratic opposition to municipal involvement, a lack of knowledge of how the technique can achieve its goals, and a lack of interest in participation by governments are also some reasons for its non-adoption (Archer, 1989).

As noted above, this technique has not yet been tried in Iran. It may be argued that in the context of rapid urban expansion in cases such as Iran, where there is a need for large quantities of land for development, that the land readjustment implementation takes too much time and is therefore not applicable. As Shibasaki (cited in Mahesan and Shaari, 1990:61) has experienced in Japan, successful implementation of land readjustment depends on the understanding and co-operation of the local residents obtained through appropriate evaluation and adjustment of their rights; and great efforts are required by the project implementation body, which tends to prolong the project period, sometimes for more than ten years. There is also a need for experts. Involving a multiplicity of landowners in large development areas is particularly difficult, so this technique is most useful for small to moderate sized areas requiring preparation and implementation in the form of self-contained projects carried out in a short period of time.

**New towns**

The question whether new land development projects should be contiguous or discontiguous requires the investigation of spatial alternatives. Various terms have been used to describe the physical characteristics of expanding cities, such as low density; compact cities; development nodes or centres; linear growth and growth corridors; regional cities; twin cities; and more widely spread cities (Minnery, 1977:28).

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17 Regarding the definition of new urban areas on the fringe, the terms "fringe", "rural-urban fringe", "urban shadow", "outer city", "suburb", "countryside", "peripheral area", "urban periphery" and "exurban zone" are used interchangeably (Bryant, et al., 1982:11; Herington, 1984:6; and Soussan, 1984:11; Darin-Drabkin, 1977:28).
There is no commonly held theoretical framework regarding form and shape of cities, despite the fact that the science of urban form has been investigated using many tools, including concepts derived from physics and mathematics (Woude, et al., 1990:20; Batty, et al., 1989:1447). The terms “urban sprawl” and “scattered development” also have widespread usage. Different perspectives have been put forward, such as "the lack of continuity in expansion . . . which well connotes its hit-or-miss character" (Clawson, 1962:99) and "a settlement pattern which because of its low density and/or messy design is wasteful of land" (Gertler, 1978:3). Capozza and Helsley (1989:295) use “urban sprawl” as a pejorative term for discontinuous and undesirable forms of spatial development (see also Neutze, 1987:379). Others consider urban sprawl in a more positive light. Ottensmann, (1977) and Peiser (1989), for example, argue that a free market in urban land generally leads to higher density development. Consequently, urban sprawl can be a more efficient way than policy direction to achieve continuous development (see also Ohls and Pines, 1975:232; Peiser, 1989:193; Breslaw, 1990:466). Lessinger (1962) suggests that scattered development can prevent the over-enlargement of residential areas in which social segregation and slums would appear. Boyce (1963) also argues that flexible urban development and efficient urban patterns can be achieved through urban sprawl and vacant lands can be reserved for future needs (see also Clawson, 1962:108; Gertler, 1978:31; Bryant, 1982:171; Hebbert, 1986; Hebbert, 1986:141; Breslaw, 1990:467; Bieda, 1991).

Nevertheless, new towns are developed by governments in many countries to curb uncontrolled urban expansion. Ebenezer Howard and his advocacy of garden cities in Britain in the early twentieth century is now recognised as the originator of the new

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18 Furthermore, the issue of optimal city size has been debated for sometime and there is no commonly held theory of optimal city size and a wide variance in size has been suggested (Richardson, 1973:85-89; Gugler, 1988:16; Clayton and Richardson, 1989:155-65; Murry in Haworth, 1978:2; Henderson, 1988; Rondinelli, 1983:115; Darin-Drabkin, 1977:284).
trends movement (Anis-Ur-Rahman and Tarek Ali Fadak, 1991:167). However, their most recent development came mainly as a response to the needs to accommodate urban growth. New towns are established for various other reasons: to implement decentralisation policies and relocation of existing population; to provide a capital; and to accommodate specific, large, projects. In Venezuela, for example, which is an oil rich state, large new cities, including Ciudad Guayana, Ciudad Alta Gracia and Ciudad Fajardo with populations of over 300,000, have been constructed to serve as growth centres, accommodating growth alternatives to Caracas (Turner in Golany, 1978:250). However, while new towns can respond to the needs of increasing levels of urbanisation and urban growth, many problems exist with the strategy. Examples of these problems are discussed below.

In the Middle East, Egypt's new towns policy is believed to have been a major contributor towards meeting the increase in the demand for high density housing, better sanitary conditions, and improved urban infrastructure. These new towns are said to offer improved housing opportunities and reduce overcrowding in the large cities. Examples are Tenth of Ramadan and Al-Obour (located 55 kilometres and 30 kilometres from Cairo respectively), Almiriya al-Gadida (located 60 kilometres from Alexandria), and Sadat (located 93 kilometres from Cairo along the Cairo-Alexandria road (Feiler in Shidlo, 1990:128). However, Feiler (in Shidlo, 1990:134) considers that the new towns policy in Egypt failed to attract sufficient inhabitants because of a lack of central planning; poor employment opportunities; few social/cultural facilities; the emphasis placed on the low-income population, making the new towns less attractive; higher living costs in new towns; a higher price of housing units for the poor; and the tendency of people to live in closed communities.

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19 For the definition of terms referring to new urban settlements such as new towns, new community, company town, development town, regional growth centre, freestanding community, accelerated growth centre, horizontal city, vertical city, new town in-city, satellite town, metro town, land subdivision, planned unit development, and new town in-town see Golany (1978:7).

20 For a comprehensive review on discontiguous urban growth see also Rodriguez-Bachiller (1986).
In Saudi Arabia new towns have been developed using oil revenues after the post-1973 boom, in order to alleviate inter-regional disparities. Major motives underlying the development of new towns in Saudi Arabia were found in various functional, financial and fiscal policies, together with anticipated institutional transformation (Anis-Ur-Rahman and Tarek Ali Fadak, 1991:172-178). Even in the United Kingdom, the leading country in new town development this century, where many new towns have been built, the outcome has only been modestly successful (Logue cited in Kehoe, 1976:41; Schaffer and Thomas in Golany, 1978:22-23).

Apart from the aim of decentralisation, new towns may also be developed in response to the needs of specific industrial and mining activities. In Angola, a poor developing country, new towns have been developed for the purpose of attracting large-scale industries mainly related to the process of agricultural produce, including Huambo New Town. In Malaysia, new towns were often developed as small industrial centres, such as Petaling Jaya, located on the outskirts of Kuala Lumpur; Port Klang and Sungei Way/Subang; and as a capital in the case of Shah Alam in the State of Selangor (Turner in Golany, 1978:250-270).

The construction of new towns in Iran began about 70 years ago when the new company town of Abadan was developed based on oil industry requirements, as discussed above. Until the revolution of 1979 several new towns were also developed, such as Fooladshahr in Esfahan province, built to meet the needs of the steel industry. Shushtar New Town was built to house the employees of a sugar cane processing plant, as well as several dormitory new towns, such as Marlik, Khaneh-e Karaj and Fardis, in Tehran province.

However, the most important policy towards the creation of new towns was that initiated in 1985. The recent new towns policy has led, as already observed, to the creation of many new towns. In this instance, it has been decentralisation and the requirements of wider mobilisation that have been the impetus. The policy mainly
aimed to counter the population growth of larger centres (Table 2.2 shows the classification of Iranian cities in 1986 by population size). It was also designed to meet the requirements of newly established industrial projects. Between 1985 and 1992, some 21 new cities were planned and are currently in progress. Proposed populations range from 70,000 (Mohajeran, near to Arak) to 900,000 (Sahand, near to Tabriz) (Figure 2.1). A governmental organisation called 'Sherkat-e Omran-e Shahrhayeh Jadid' was established in 1988 to manage the firm establishment process. Most of these new towns are being developed for the purpose of accommodating growth as alternatives to large cities, such as Hashtgerd, Parand and East Tehran (Aabanjirak), which are located some 30 to 40 kilometres to the west, south and east of Tehran.

Table 2.2 Classification of Iranian cities in 1986

<table>
<thead>
<tr>
<th>Class</th>
<th>Number</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities 500,000 +</td>
<td>8</td>
<td>11,996,093</td>
</tr>
<tr>
<td>Cities between 250,000-500,000</td>
<td>8</td>
<td>3,330,340</td>
</tr>
<tr>
<td>Cities between 100,000-250,000</td>
<td>25</td>
<td>3,374,860</td>
</tr>
<tr>
<td>Cities between 50,000-100,000</td>
<td>46</td>
<td>3,087,893</td>
</tr>
<tr>
<td>Cities less than 50,000</td>
<td>409</td>
<td>4,991,214</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>496</td>
<td><strong>26,780,400</strong></td>
</tr>
</tbody>
</table>

Source: calculated from various sources.

Figure 2.1 Cities near which new towns have been planned, 1991

The policy has presented a challenge to Iranian urban and regional planning as a whole. From a demographic point of view, for example, Zanjani (cited in NCDC, 1991:11) argues that "... the most important question that arises is whether the creation of new towns on such a scale in our country is necessary or not, and if the answer be positive, what the population extent and lapse of time necessary to obtaining it be" (text unaltered). Mohajeran New Town, located in the case study area of this research, is examined in detail in Chapter Eight.

2.3 Key themes for the critical study of residential land development

This study has set out to make new contributions to the policy evaluation process in Iran by judging urban land development policies according to their effectiveness, equity and environmental quality. The literature on urban land development suggests that urban land development policies should be judged according to the extent to which they provide an adequate supply of land for housing, infrastructure and public facilities, and facilitate good town planning in conjunction with environmental considerations. Clearly, governments will need to know if they have been successful in this endeavour. It is essential for the responsible agency to monitor the implementation of new systems. However, no evidence exists in the relevant literature to suggest anything of this kind has been done in Iran, or in other developing countries in the Middle East (see Simon, 1990:8). A post-implementation evaluation, therefore, becomes a means to improve the quality of the development process. As McAuslan (1992:30) argues:

... an agency should be seen as an ally in the process of reform and improvements; it is not there to pick holes and find faults, but to work with administrators on the ground, help with the process of integrating new approaches with old beliefs and practices, and keep an eye on the overall goal: A more efficient, effective, and equitable system of land development administration. Hence, the role of such an agency in feedback: It will be in the best position to know what has gone well and what has not; what needs further thought and improvement; and which parts of the bureaucracy need reassurance and which need revamping.
Regarding the pre-revolutionary Iranian planning system, Costello (1977:86) argues that "for the most part there has been little direction to urban growth because of the weakness of planning legislation and the will to enforce it, and the weakness of municipal councils". Similarly, since the revolution, there appears to be no research concerning post-implementation evaluation (to the author's knowledge in working for the MHUD and ULO for over eight years from 1982 to 1991). As noted in Chapter One, Mowlazadeh (1991), in one of the very few contemporary studies, has examined post-revolutionary urban land policies in Iran from a cultural, legal and organisational point of view but has not considered urban land development policies in the normative terms of effectiveness, equity and environmental quality. The point emphasised here is if effective urban land development policies are not established in Iran, future residential areas will be confronted by problems of squatter settlements, slum areas, shanty towns and spontaneous development. The following three areas are the focus of this study and will be further developed in this research.

Land supply

It may be argued that the effectiveness of any land supply system depends on many factors including decision-making related to land use, the structure of demand and supply programs, and funding (Farvacque and McAuslan, 1992:74; Archer, 1989:308). Effective urban planning may be achieved through public intervention in the provision of public facilities, such as schooling, housing and health. Furthermore, land banking by the public sector can solve the problems of development in two ways: firstly, by providing opportunities for government to plan the development; and, secondly, by transferring growth pressure from the existing community to planned areas by promoting the advantages of new places, and in particular, lower prices for land (see Wickersham and Dahl cited in Roberts, 1977:220 and Penasula in Kehoe et al., 1976:4). On the other hand, problems associated with advanced land acquisition may be considered in terms of a lack of funds, a lack of confidence in
government institutions, a lack of long term decision making, and a lack of law and authority. Since the new urban land development policy in Iran was based on public land ownership, this study will examine the success or failure of the policy with respect to public land. The relationship between public land ownership and urban development as a whole is investigated.

In the context of land supply, the strategy of increasing residential density has recently received wide attention among Iranian urban land development policy makers. The main objective of this strategy has been to meet the excessive demand for housing and land. However, whilst a density increase may result in more dwellings, it can also give rise to additional problems, such as pressure on infrastructure and public facilities. For this reason, increasing residential density should not be considered as a general response to reducing problems of rapid urban expansion and urban sprawl. A detailed analysis of the effectiveness of this strategy and its various impacts at the local level in Iran is discussed in Chapter Eight.

*Infrastructure provision*

The most important and prevailing theme in the development of new residential areas in Iran, it can be suggested, is in infrastructure provision. As noted above, the infrastructure system covers a wide range of projects and several problems are evident, including adequacy, delays and funding. For the purposes of this study, the focus is on some of the services that are generally considered in the literature as being fundamental to residential development needs; water supply, sewerage and drainage systems, electricity and local roads. The main reason for this focus relates to the nature of the new urban land development policy in Iran which emphasises or targets the provision of these elements at the local level.

Apart from institutional issues, financing urban infrastructure becomes a very sensitive aspect of urban land development and it is an issue of increasing importance,
particularly in developing countries on which much of the literature is focused (see Simpson, 1983; Feldman et al., 1988:2; Bahl and Linn, 1992; Murphy, 1993). A variety of means are currently used throughout the world to finance urban infrastructure in new areas and many countries have attempted to apply innovative methods to address this issue. The user-pays system in Iran is part of this process. Feldman et al. (1988:2) point out:

*Taking a safe, reliable system of public works for granted could result in dramatic economic damage and reduced prosperity. For continued economic and social well-being, a nation must find an effective means of ensuring a high level of quality in its public works infrastructure. This means lies above all in creative methods of financing.*

The World Bank (1991b:36) also suggests that:

*Failure of public management and scarcity of financial and technical capacity have resulted in widespread deficiencies in water supply, electricity, transportation, communications, and solid waste management. These deficiencies impose heavy burdens on the productive activity of urban households and enterprises.*

Regarding the issue of equity, the delivery of basic infrastructure to the poor is a problematic issue. In the context of financing basic infrastructure based on the Iranian user-pays system, the ability of users to pay remains a serious problem. According to the regulations of the Urban Land Law, land applicants must not own any housing. This means that most governmental land applicants in Iran are from the low to middle-income groups. In this context, affordability issues must be analysed to explore the success or failure of the urban land development policy with particular reference to the people involved.

Affordability issues become particularly important when they are analysed in terms of development costs. The greatest criticism of rapid urban expansion and urban sprawl is that it leads to low densities with consequent problems, including high costs of development and likely environmental degradation. As the study by Adrian and Trueman (1991) has revealed, lot size and density levels have considerable effects on
infrastructure costs in different locations. The study also explored the extent of infrastructure costs based on physical conditions and location. The need to spend a high proportion of the family income on infrastructure is usually the most important concern found in low density patterns of urban development. Hebbert (1986:143) has called it 'uncompensated costs for third parties' and points out "one of the strongest traditional arguments for planning intervention at the urban fringe is that householders suffer financially from the land use distributions produced by a free speculative market".

Environmental quality

As already observed, the environmental problems associated with rapid urban growth and expansion are widely documented. Despite this, environmental concern in the developing countries is booming, and the 'brown agenda' is being addressed (see for example, Drakakis-Smith, 1995). There are many environmental issues, including water supply, sanitation and air pollution which must be taken into account in the evaluation of urban land development policies. The protection of good peri-urban agricultural land and the provision of infrastructure are considered in this study as important environmental quality considerations. The conflict over the protection of good agricultural land on the one hand, and response to the requirements of land demand on the other, is equivocal. The question that arises from this conflict is whether it is possible to protect agricultural land and at the same time ensure sufficient supply for urban development and expansion. According to Breslaw (1990:467):

It is not that sprawl is the problem; rather it is that insufficient or inadequate planning is undertaken to determine the sort of environment that best suits human settlement... It is through planning, and only through planning, that one will achieve urban regions that are compatible with both human settlement and human development.
A number of other issues are taken up from the literature discussed in this chapter and examined later in this thesis. Among these are growth centre strategies. As discussed above, they have had extensive effects on urban growth and expansion of provincial cities in Iran. A major lesson from growth centre strategy is that it gives rise to fundamental changes in many aspects of planning. The question is whether the strategy has acted positively. One of the best known weaknesses of growth centres has been their negative impact on general regional development. For example, new growth poles have tended not to have had a close relationship with rural development, rural employment or rural incomes. The city of Arak, an example of the implementation of growth pole strategies in Iran, has experienced changes in its demography, economy and physical structure which will be examined in Chapter Six.

In the light of these key themes, Chapter Four deals with evaluation issues in the process of urban land development policy in Iran, in particular, the three criteria of effectiveness, equity and environmentally sustainable development are discussed.
Chapter Three
THE CONTEXT OF URBAN EXPANSION AND URBAN DEVELOPMENT IN IRAN

3.1 Introduction

As noted in the introductory chapter, Iran, like many countries, has experienced rapid urbanisation and urban expansion over the last few decades giving rise to various problems. This chapter examines the major issues concerning rapid urban expansion and urban development; the first part deals with the causes of rapid urban expansion in Iran, to which the new urban land development policy (developed since 1985) was a response. Amongst all the factors influencing urban expansion described in Chapter Two, the three prime factors which have contributed most towards the immense urban expansion are the high population growth rate, the process of urbanisation and the condition of housing.

The second part provides, firstly, a description of urban development in both pre-revolutionary and post-revolutionary periods. This may be seen as providing a background to the analysis of urban land development policy which is the major aim of this research. The second section deals with the analysis of the critical period, prior to 1985, of urban land development in Iran. Post revolutionary land policies together with their outcomes are discussed.

3.2 Population growth and urbanisation process

Rapid population growth has been the prime source of urban growth in Iran. The annual rate of population growth in the country has been very large over the last few decades and is one of the highest in the world. Until 1956, when the first official census of population and housing in Iran was conducted, the population had been increasing steadily with an annual growth rate which never exceeded two per cent.
Five reasons have been suggested for this low rate of population growth, including: (1) contagious decease such as chilera, plague, typhoid, typhus and malaria; (2) years of dearth or famine, such as those in the whole country in 1918 and Kermanshah in 1943; (3) natural disasters, particularly earthquakes (Iran is located in a prone earthquake region); (4) political strikes across the country between various local communities; and (5) emigration to foreign countries such as 10000 Christians to Russia in 1913 (see Zanjani, 1992a:20-26).

However, between 1956 and 1966, the growth rate dramatically increased. The population which was about 19 million in 1956, increased to over 25 million by 1966, with an annual growth rate of 3.13 per cent. Although during the period 1966 to 1976 the annual growth rate decreased to 2.7 per cent\(^1\), it again reached 3.9 per cent between 1976 to 1986. This was the highest rate in the country's history, resulting in a population of some 49 million in 1986 and 55.8 million in 1990 (Figure 3.1) (MHUD, 1992a:2).

\(^1\) The decline in the rate of population growth between 1966 and 1976 was mainly as a result of family planning control which was conducted in Iran prior to the revolution.
Two important reasons may be suggested for the recent growth rate including: the absence of a family planning policy in the immediate period after the Islamic Revolution of 1979 and immense immigration from other countries, particularly from Afghanistan and Iraq (see also Aghajanian, 1991).

Table (3.1): Comparison of the urban population of Iran and other countries by income grouping

<table>
<thead>
<tr>
<th>Income Grouping</th>
<th>As a percentage of total population</th>
<th>Average annual growth rate (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income economies</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>Middle income economies</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td>High income economies</td>
<td>72</td>
<td>77</td>
</tr>
<tr>
<td>World</td>
<td>36</td>
<td>50</td>
</tr>
<tr>
<td>Iran</td>
<td>37</td>
<td>57</td>
</tr>
</tbody>
</table>


Estimations of future population growth are also of concern. Different rates of population growth have been estimated by various organisations and scholars. However, all agree that there will be a continuation of rapid population growth in the future and the total will have grown to 89 million and 134 million by the years 2006 and 2021, respectively, or alternatively will reach 78 million and 166 million by the years 2000 and 2025, respectively (Zanjani, 1992a:39 and World Bank, 1992a:269).

With respect to urbanisation, a spectacular trend in urban population growth has occurred in the last decades leading to rapid urban expansion in the country. While the urban population of Iran was 2.1 million in 1900, it increased to 3.2 million in the 1940s, resulting in 21 per cent of the total population living in urbanised areas (Costello, 1977:31). In 1956, 31 per cent of the total population were living in urban areas. This figure increased to 38 per cent by 1966 and 47 per cent by 1976. The degree of urbanisation in Iran, however, accelerated after the revolution of 1979.
Between 1976 and 1986, a total of 3.5 million population migrated from rural to urban areas, whereas a total of 1.3 million moved from urban to rural areas (Zanjani, 1992a:214). The rate of urban population grew to 5.4 per cent during this period and the population reached some 27 million in 1986. The proportion of urban population also increased to 54 per cent in 1986 and 57.8 per cent in 1991 (Zanjani, 1990:11; MHUD, 1992a:2; and World Bank, 1992a:279; see also Tables 3.1, 3.2 and Figure 3.2).

Table (3.2). Annual rate of population growth by urban and rural areas, 1956-1986

<table>
<thead>
<tr>
<th>Period</th>
<th>urban area</th>
<th>rural area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956-1966</td>
<td>5.02</td>
<td>2.1</td>
</tr>
<tr>
<td>1966-1976</td>
<td>4.94</td>
<td>1.1</td>
</tr>
<tr>
<td>1976-1986</td>
<td>5.41</td>
<td>2.4</td>
</tr>
</tbody>
</table>


Figure (3.2): Trend of population growth in Iran by total and urban area, 1900-1991

Estimates of urban population growth in the future are a source of concern as are estimates of total population growth. It is estimated that the proportion of urban population of Iran will reach 65 per cent and 72.5 per cent by the years 2001 and 2011, respectively (Table 3.3). Alternatively, these figures will increase to 69 per cent and 74
per cent in 2006 and 2021, respectively (MHUD, 1992a:4. Zanjani (1990b:6) also estimates that by 2011 only 28 million people will live in rural centres with populations of less than 5000 inhabitants. Consequently, some 74 million will live in urban centres.

Table (3.3). Population forecasts, millions

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Urban</th>
<th>Rural</th>
<th>Urban proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>57.9</td>
<td>33.5</td>
<td>24.4</td>
<td>57.8</td>
</tr>
<tr>
<td>2001</td>
<td>78</td>
<td>50.7</td>
<td>27.3</td>
<td>65</td>
</tr>
<tr>
<td>2011</td>
<td>102</td>
<td>73.9</td>
<td>28.1</td>
<td>72.5</td>
</tr>
</tbody>
</table>


Apart from natural population growth, the extent of rural-urban migration has been the main source of rapid urbanisation. The proportion of rural population to total population has been declining for many years. Between 1966 to 1976 some 40 per cent of urban population growth was the result of rural migration, but this accelerated in the following decade. Between 1976 to 1986 the rate of urban population growth was 6
per cent, whereas for centres with less than 5,000 inhabitants it was two per cent (Zanjani, 1990:59, Nazari, 1989:150). Migration figures in the last period between 1976 and 1986 showed that the highest percentage related to the move from rural areas to urban areas. From 22.3 per cent total migration in the country, 7.8 per cent were from villages to cities and the remainder were from cities to cities, cities to villages or from villages to villages (MHUD, 1990:4). It should be noted that a further factor contributing towards mass migration to urban centres during the last decade was the war between Iran and Iraq. It is notable that four provinces were located in the war region. As Figure 3.3 illustrates, a major part of intra migration in Iran is related to migration from war damaged areas.

The major reasons for rural-urban migration in Iran, as is the case in many other developing countries, are lack of social welfare and lack of economic activities resulting in the high level of unemployment in rural areas (see Brown cited in Goldscheider, 1983:189). Unemployment is the most important factor in rural urban migration. It may be argued that establishment of industries in rural areas can help retain people who would otherwise migrate to large cities. However, as has been experienced in the post-revolutionary period, such industrialisation failed to achieve the goals. The major reason for this has been that these industries have been isolated from other regional activities and have not been developed based on long term planning. The absence of regional planning, as will be discussed later, has played a major role in this failure (Zanjani, 1990b:8). Between 1976 and 1986, the total rural population increased from 17.9 million to 22.3 million. However, the total number of employed population (10 years and over) increased from 4.6 million to only 4.9 million. In other words, for a new 4.4 million rural population, the total employment opportunities were only 0.3 million. In this period, the total employment in the agricultural sector reduced from 3.1 million in 1976 to 2.8 million in 1986 (Zanjani, 1990:8).
Regarding the spatial pattern of population distribution, including the prevention of rural-urban migration, the following four general points have been suggested by various research and government organisations, including: (1) increasing rural population and prevention of rural-urban migration; (2) proper spatial distribution of population in the country through settlement of more population in less developed regions, particularly in the south, south-east and east; (3) emphasis on the role of secondary cities and small towns; (4) creation of new cities (Zanjani, 1990b:7). However, there has not been any serious attempt towards the first three points. The only policy that has been attempted by the government is the creation of new towns which was discussed in Chapters One and Two.

3.3 Housing conditions

While housing conditions may cover a broad range of issues, an analysis of Iranian housing conditions is presented here to demonstrate the effective outputs of key housing indicators and their relationship with urban expansion in the country. There are a number of critical concerns relating to housing assets in the country that need to be addressed. Three key indicators causing rapid urban expansion include housing production, floor space ratios and the pattern of density. A housing production indicator is a measure of the ability of the housing supply system to respond to housing demand. However, increasing urban housing stock leads to an increase in urbanised areas, and consequently more urban expansion with resultant needs and problems such as the need for provision of infrastructure and public facilities. Another housing issue is the extent of average floor space which is one of the most important aspects of the housing challenge in the present situation of Iran's housing conditions. These are discussed below.

It should be noted that the lack of availability of housing statistics prior to the revolution is a major concern for an effective analysis of pre-revolutionary housing conditions. Until recent years there has been very little and inadequate information on
housing in the national economy as the MHUD emphasised that the first post revolutionary housing plan (1989-1993) was the first comprehensive housing plan in the country's history (MHUD, 1990:1). However, the MHUD has been providing relatively adequate information and statistics on the post-revolutionary housing conditions including major indicators which can be used efficiently in studies such as this.

**Housing production and demand**

Despite the extent of population growth in Iran from 1976 to 1986, the supply of housing exceeded the new population. As noted in Chapter One, the annual growth of constructed housing reached 4.4 per cent whereas the household growth rate was only 3.9 per cent. Between 1976 and 1986 the housing stock in the country increased from 2.3 million to 4.6 million (Zanjani, 1992b:3 and MHUD, 1992a:7). In other words, the number of housing units doubled in ten years. As a result of this, the number of dwellings per thousand of population in urban areas increased from 150 dwellings in 1976 to 175 in 1986 (MHUD, 1988c:14). The most important factor causing this mass housing production was the change in urban land policies initiated after the revolution resulting in massive land supply, and consequently more urban expansion. This issue is discussed more fully in Chapter Five.

Overcrowding, home ownership levels and housing quality figures are three important aspects of large scale housing production. While overcrowding has been one of the major problems of Iranian cities, particularly in large cities, post-revolutionary housing production decreased its level. The number of families\(^2\) per dwelling in the whole

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\(^2\) It is important here to define the terms 'household' and 'family'. In western literature, households refer to people who live in a house irrespective of their personal relationships. However, in Iran a single house might have one, two or more families. Those families who do not own a house may live in rental units or live with their relatives. Consequently, the level of homelessness in Iran is very low
country dropped from 1.26 in 1976 to 1.17 in 1986. In urban areas, this figure dramatically dropped from 1.37 to 1.18 and in rural areas it dropped from 1.18 per cent to 1.15 per cent (MHUD, 1990:10). Table (3.4) compares overcrowding figures in Iran between 1976 and 1986 censuses.

Table (3.4): Overcrowding figures: number of families per unit (percentage)

<table>
<thead>
<tr>
<th>Year</th>
<th>One-family</th>
<th>Two-families</th>
<th>Three-families</th>
<th>Four-families or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>82.7</td>
<td>12.2</td>
<td>3.4</td>
<td>1.7</td>
</tr>
<tr>
<td>1986</td>
<td>87.3</td>
<td>10.1</td>
<td>2.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Urban area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>75.3</td>
<td>16.8</td>
<td>5.2</td>
<td>2.8</td>
</tr>
<tr>
<td>1986</td>
<td>85.9</td>
<td>11.3</td>
<td>2.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Rural area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>88.8</td>
<td>8.5</td>
<td>2.0</td>
<td>0.8</td>
</tr>
<tr>
<td>1986</td>
<td>89.2</td>
<td>8.6</td>
<td>1.7</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: MHUD, 1988c:23.

Since the recent mass housing production there has been a change in the level of home ownership. Although there is no inherent value in a higher level of home ownership, because the rental housing sector may be vibrant and efficient, it is an indicator measuring residential choice such as owning or renting preferences. The predominant form of tenure in Iran is owner occupation and increasing the proportion of owner-occupied housing has been given a high priority since the revolution. The proportion of families in owner-occupied housing in urban areas of Iran increased from 62.5 per cent in 1976 to 69.4 per cent in 1986 (MHUD, 1990:7). In contrast, the proportion of rental housing to total available housing decreased from 15.2 per cent in 1976 to 11.5 per cent in 1986 and 11 per cent in 1989 (MHUD, 1992a:27).

in comparison with many other developing countries. Therefore, the term family is used throughout this study instead of household.
The extent of housing production has also affected housing quality and the proportion of below-standard dwellings. Iran's shanty towns and inner-city slums are small compared to those in other developing countries. While informal settlements in many cities of developing countries such as Addis Ababa (Ethiopia), Luanda (Angola), Dar es Salaam (Tanzania), Bogota (Colombia), Ankara (Turkey), Lusaka (Zambia), Tunis (Tunisia), Manila (Philippines), Mexico City (Mexico), Karachi (Pakistan), Caracas (Venezuela), Nairobi (Kenya), Lima (Peru) and Sao Paolo (Brazil) range from 32 per cent to 85 per cent (see Habitat, 1987:3), in Iran it has been only 0.3 per cent. Nevertheless, as a result of the post-revolutionary housing production, the number of hut dwellers declined from 2.5 per cent in 1976 to 0.9 per cent in 1986 (MHUD, 1990:10 and Table 3.5).

Table (3.5). Percentage of Tents, Huts, Hovels, etc, compared to total housing stock

<table>
<thead>
<tr>
<th></th>
<th>1976 %</th>
<th>1986 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>2.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Urban area</td>
<td>0.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Rural area</td>
<td>4.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>


Despite massive production in the period from 1976 to 1987, the increased level of home ownership and improving housing quality, housing shortages still persist in the cities. In 1986 there was a shortage of 1.4 million dwellings in the country and the goal of one person per room has so far not been achieved (MHUD, 1990:10). It is estimated that during the next three decades when the population of Iran is expected to reach 130 million, housing demand will be a major problem. In the initial period of the next thirty years, the need for housing will be 548,000 units per year while during the later years the need will rise to 851,000 units per year (Zanjani, 1992b:11). It was projected that between 1988 and 1993 (the First Five Year Plan), 2,285,000 units would have been built (1,582,000 in urban areas and 703,000 in rural areas) (MHUD, 1990:19). Furthermore, statistics on annually required construction based on the
demographic deficit represent new demand only, whereas other needs, such as the replacement of deteriorated units and quality improvements still remain, adding to housing demand.

*Floor space, housing types and density*

Parallel with the mass housing production in recent years, average floor space of newly constructed units by the private sector\(^3\) increased from 142 square metres in 1976 to 149 square metres in 1986 (the average floor space of existing residential units was 104 square metres) (MHUD, 1990:6 and 1992a:6-8). This indicator was not only relatively higher in Iran compared to other regions of the world but also has increased in recent years. Floor space per capita has also been much larger in Iran than in many other countries, contributing towards more urban expansion (Tables 3.6 and 3.7).

Table (3.6): Floor space per capita: a comparison between Iran and other countries by income group in 1992

<table>
<thead>
<tr>
<th>Income Grouping</th>
<th>Floor space per capita (Sq.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income countries</td>
<td>6.09</td>
</tr>
<tr>
<td>Low-mid income countries</td>
<td>8.80</td>
</tr>
<tr>
<td>Middle income countries</td>
<td>15.09</td>
</tr>
<tr>
<td>Mid-high income countries</td>
<td>21.98</td>
</tr>
<tr>
<td>High income countries</td>
<td>35.00</td>
</tr>
<tr>
<td>Iran (existing)</td>
<td>30.00</td>
</tr>
<tr>
<td>Iran (new dwellings)</td>
<td>32.70</td>
</tr>
</tbody>
</table>


Table (3.7). Average floor space (existing and new) in urban area, Iran (Square metres)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing floor space</td>
<td>104</td>
<td>105</td>
<td>107</td>
<td>110</td>
<td>112</td>
</tr>
<tr>
<td>New dwellings floor space</td>
<td>149</td>
<td>157</td>
<td>156</td>
<td>155</td>
<td>157</td>
</tr>
<tr>
<td>Floor space per person</td>
<td>18.3</td>
<td>18.3</td>
<td>18.3</td>
<td>18.2</td>
<td>18.1</td>
</tr>
</tbody>
</table>


\(^3\) Private sector here refers to housing construction by individuals which is 95 % of housing provision in Iran.
The next housing indicator contributing towards rapid urban expansion in Iran is the pattern of housing density. With the exception of Tehran and a few large cities such as Esfahan, Shiraz and Mashhad, where walk-up apartments or high rise buildings are common, all Iranian cities exhibit a low density housing pattern with one-storey houses. As Table 3.8 reveals, the majority of dwellings are houses. Their level also increased since the revolution from 87.5 per cent in 1976 to 89.5 per cent in 1986. However, the pattern of housing density of new dwellings has begun to change in recent years. The proportion of new houses in urban areas dropped steadily: from 67.7 per cent in 1982 to 46.8 per cent in 1989 (Figure 3.4).

Table (3.8): Existing density pattern in urban areas of Iran

<table>
<thead>
<tr>
<th>Year</th>
<th>1976</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses</td>
<td>87.5</td>
<td>89.5</td>
</tr>
<tr>
<td>Two-storeys</td>
<td>7.1</td>
<td>8.2</td>
</tr>
<tr>
<td>Three-storeys or more</td>
<td>5.4</td>
<td>2.3</td>
</tr>
</tbody>
</table>


Figure (3.4). Density pattern of new dwellings by storeys in urban area, Iran

Source: Based on data from MHUD, 1992a:11.
3.4 Pre-revolutionary urban development

It is not the aim of this research to give a detailed analysis of urban development in Iran. However, it is essential to note that any urban land development relies on the policies regarding urban development as a whole. Traditionally, the economy of Iran had been based on agriculture. A major change to the agricultural based economy of the country occurred as a result of the more recent exploitation of natural resources, mainly oil. The GNP of the country dramatically increased from 180 billion Rials\(^4\) in 1971/72 to 1,635 billion Rials in 1974/75, and oil revenue increased from US$5 billion to US$20 billion. The initiation of national plans, beginning with the first plan in 1949, emphasised industrialisation and ignored the agricultural sector (Mofid, 1987:37 and Mowlazadeh, 1991:100).

Prior to 1949, little defined planning existed, though a few planning policies can be found in the pre-1949 period. Iran's first legislation regarding urban planning was the Municipal Act enacted in the Majlis (parliament) in 1913. On the basis of this act, city and regional councils were formed; however four years later they were dissolved. The first policy to address the issue of physical features of the urban centres was the "Street Widening Act of 1933" which allowed municipalities to widen the traditional narrow urban network. Thereafter, physical urban improvement took place through other acts such as: Renovating Old Quarters, Building Imposing Squares and New Building. Until 1949, the Ministry of the Interior in charge of central government undertook the responsibilities of the councils. In this year, the Law of Independence of Municipalities was ratified (Mozayeni, 1974).

\(^4\) Regarding the Rial conversion rate, it should be noted that at the time of revolution in 1979, the official rate was about 70 Rials to the US$1. Since then, however, this rate has changed and several rates are being used, such as a floating rate of 1750 Rials and most recently 3000 Rials to the US$. 

68
Urban activities including the provision of urban services, for example, potable water supply, electricity and street surfacing, were first considered in 1947. Although in 1949 the First Development Plan (1949-1955) was initiated and the Plan Organisation was formed, these urban development activities were not considered separately in the plan. In the Second Plan (1956-1962), however, more attention was paid and a specific policy regarding the financing of these activities was initiated. According to this plan, if municipalities provided 50 per cent of the funding for an urban development project, the rest of the funds would be granted by the central government. A serious step towards urban development was taken during the Third Plan (1963-1967). Six major urban development objectives were considered in this plan as follows: the continuation of unfinished projects of the Second Plan; payment of loans or grants for the provision of urban infrastructure and public facilities; improvement of municipalities' affairs; preparing the regulations for the provision of infrastructure including water, electricity, housing, health centres and roads; cities were classified into four types (based on their development status and their needs) in which each type could be granted different amounts of funds; and finally one hundred per cent of the cost of activities for cities of types 3 and 4 (in less developed regions) were provided by government (MHUD, 1989:19).

Table (3.9). Urban Development Projects in the Third Plan (1963-1967)

<table>
<thead>
<tr>
<th>Projects</th>
<th>Proposed</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water and sewerage</td>
<td>347</td>
<td>143</td>
</tr>
<tr>
<td>Street surfacing and asphalt</td>
<td>142</td>
<td>98</td>
</tr>
<tr>
<td>Slaughterhouse</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Small health projects</td>
<td>118</td>
<td>86</td>
</tr>
<tr>
<td>Urban safeguarding (flooding)</td>
<td>54</td>
<td>43</td>
</tr>
<tr>
<td>Research</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>694</td>
<td>384</td>
</tr>
</tbody>
</table>

From a total budget of the Third Plan (230 billion Rials), 7.2 billion Rials (3.3 per cent) was allocated to the urban development sector. However, only 384 urban development projects (out of 694 proposed projects) were completed during the Third Plan (Table 3.9). During this period, a high council for city planning was established. The main duties of the council were to guide city master plans and to set regulations and standards for their implementation (MHUD, 1989 and Mozayeni, 1974:266). Housing construction and urban development were considered in the Third Development Plan (1962-1967) as a separate issue for the first time. The budget provided for housing construction was 5.7 per cent and the share of budget for urban development activities was 3.3 per cent of the total plan budget (Mofid, 1987:50).

In 1963, a 'Growth Pole' strategy was initiated and the regionalisation of the sectoral programs was formed. According to this strategy, large-scale industrial and agricultural poles were introduced and different regions were defined as appropriate for different economic activities. The cities of Esfahan, Tabriz, Arak, Ahvaz and Qazvin were considered industrial and the regions of Gilan, Gorgan, Minab, Esfahan, Khuzestan and Azarbayjan were considered agricultural poles. All these areas were provincial capitals or rapidly growing cities, and were in the more, rather than less, developed regions (Amirahmadi, 1986:513).

In the Fourth Plan (1968-1972), urban development activities concentrated on the improvement of municipalities and the implementation of projects through central government loans and grants. In the middle of the Fourth Plan period, central government planners for regionalisation made an effort to effect regional development. Iran was divided into 11 planning regions, and 30 mesoregions and 140 micoregions (city-centred regions) were initiated by Iranian planners and the Battelle Institute (an American consulting firm) on the basis of socioeconomic and geographic factors. The Fifth Plan, however, rejected this division on the basis that it did not coincide with the political and administrative division of the country which already had 23 provinces.
The next attempt at regional development came in the last years of the Fifth Plan. The centre for National Spatial Planning was established to deal with urban, regional and local planning issues. On the basis of the 13 largest cities, the country was divided into 13 macroregions (Amirahmadi, 1986:508-11).

Regional inequality in Iran has been widely researched. Variations in development can be explained in terms of natural resources, ethnic and cultural differences and unequal exchange among regions. However, as Amirahmadi (1986: 502) pointed out, one of the more important determinants in development was policy formulation. Indeed, regional planning on the basis of resources has never been undertaken. For example, Khuzestan is one of the richest regions and has the most abundant oil supply. In contrast, Tehran is the highly bureaucratic administrative centre of the country (see also UARC, 1991b). A centralist school of thought among Tehran bureaucrats was the most important factor preventing regionalisation in the past, as Amirahmadi (1986:512) pointed out:

*Generally speaking, regional planning hardly ever existed in Iran. This is especially true when it is defined as a framework for managing change at the regional level and as a vehicle for the balanced distribution of socioeconomic resources and for a rational territorial division of labor for the purpose of national and regional integration, territorial specialisation and diversification, and the reproduction of regional society. Iranian planning documents hardly ever mentioned “regional planning”; their preferred terminology was “regional development,” which primarily meant “utilisation of regional resources for national growth.”*

The Fourth Plan introduced a series of administrative changes at the regional level for the purpose of decentralisation. However, large-scale industrial and agricultural growth continued to expand in some regions, mainly in developed provinces. In this plan, the two important urban development activities were; (1) the move to make municipalities self-contained, and (2) the provision of infrastructure through governmental loans and grants. The ratio of grants and loans depended on the size of cities: for large cities more credit was offered as loan (70 per cent) and less as grant
(30 per cent). For small cities, 80 per cent was offered as grant and 20 per cent was as loan. Approved credit for the urban development sector during the Fourth Plan period (1968-72) was 1.5 per cent and for housing construction it was five per cent (MHUD, 1989: 21 and Mofid, 1987:91).

Urban development was seen in the Fourth Plan as the preparation of master plans for major cities and guide plans for small towns. Further, personnel training and municipal organisation improvement were also added to the plan objectives. However, most urban development plans, such as the provision of urban infrastructure and public facilities, were not achieved. Reasons for the failure of the fulfilment of master plans included ignoring certain requirements and the conditions of cities concerned were not taken into account. Also, consulting firms were not responsible to municipalities after the submission of plans to the High Council and approval. The financial and administrative capacities of the municipalities were also not considered in the master plans (Mozayeni, 1974:266 and Costello, 1977:86).

The impact of oil price rises in 1973 resulted in the Fifth Five Year Plan (1973-1978) which was revised in the first year of the plan. By August 1974 a full-scale revision was completed with a capital investment double the budget of the original plan, and amounting to some US$70 billion. However, it did not conform with the administrative capacity of the country. According to the revised plan, housing expenditure was the second largest sector after defence, followed by manufacturing (Turner and Bedore, 1979:26). In the Fifth Plan, six major activities were as follows: preparation of master plans for major cities and guide plans for small ones; preparation of detailed plans; preparation of large scale urban cadastral maps; creation of urban planning offices in municipalities; training technical personnel for municipalities; and finally the provision of potable water, sewerage, flooding, road improvements and renovation plans (MHUD, 1989:22). Of the 51 million Rials allocated for the urban development sector during the Fifth Plan, 5.18 per cent was for urban planning (MHUD, 1989: 4-14 and Mofid, 1987:62).
Private developers were rarely involved in urban development activities or in the provision of infrastructure in particular. The first and perhaps the most important policy regarding the private developers was formulated in 1976, when the first regulation was passed in cabinet to create and develop new sites (new towns). This regulation applied only to those areas which were located outside the boundaries of cities. The government set specific responsibilities for the private sector, such as their commitments for infrastructure provision. The new towns were defined as centres with at least 500 dwellings. The developers were asked to provide basic infrastructure, including road surfacing, street lighting and water supply.

During 1966-1967 'the preparation of city master plans to control and direct land-use development' was introduced as one of the control measures for a decentralisation policy (Amirahmadi, 1986:514). In 1966, the High Council of Urban Planning and Architecture was formed. In the Fifth Plan, the preparation of master, guide and detailed plans together with personnel training were considered, however, it did not consider implementation regulation. Further objectives included the provision of water, sewerage and the improvement of road networks. In 1966, the first master plan was approved by the High Council. Prior to the revolution (1979), 97 master plans were approved and by 1991 this figure had increased to 221 plans.

3.5 Post-revolutionary urban development

In the urban development section of the First Five Year Plan (1989-1993), it was pointed out that the previous activities had concentrated on the preparation of master plans for major cities and guide plans for small cities. These plans could not work mainly due to financing problems. The new First Five Year Plan also criticised the previous plans in two aspects: the first was that master plans lacked a direct organisation responsible for implementation; and the second that funding was insufficient and economic resources inefficiently utilised. The plan suggested five reasons for the ineffectiveness of previous plans as follows (PBO, 1989:5-14). The first
reason was the lack of proper policies and regulations, and contradiction of laws. Secondly, the management of municipalities was inappropriate, particularly in medium and small sized cities due to the shortage of equipment and personnel. Thirdly, there was a shortage of infrastructure and inappropriate allocation of funds in some cities. The fourth reason was the lack of public participation in urban development activities owing to mismanagement of public interest. Finally, unregulated migration was not considered by urban planners.

A further difficulty arose because the master plans had been developed on the basis of previous population growth rates. The most recent pre-revolutionary master plans were designed according to the rate of 1966-1976 which had been the lowest in the last 40 years. Therefore, urban development activities in the First Plan were classified into eight categories including: urban planning and design; potable water supply; sewerage systems; improvement of urban traffic, roads, and transportation; other infrastructures; improvement of urban affairs and the management of municipalities; flooding projects; and improvement of urban environment. The total public budget launched for these activities was 100.9 billion Rials. Municipalities were also encouraged to be financially self-sufficient and the government planned to provide supplementary funds from urban users. While in 1979, the first year after the revolution, the total budget for urban development was 29.6 billion Rials, in 1987 it increased to 31.9 billion Rials, and in 1988 dropped to 19.7 billion Rials (Urban Development Section of the First Five Year Plan, pp. 4-14).

The High Council of Planning began decentralisation in 1990. As a first step, it gave provincial councils the responsibility of the approval of some urban centre plans, including those located in the Iran-Iraq war damaged areas and urban centres with population under 200,000. These councils consisted of provincial governor generals and general directors of the relevant organisations. The major objective of this administrative decentralisation was to allow the High Council to concentrate on major
policy decision making such as regional planning, creation of new cities and the general regulation of urban development (UARC, 1991a:2).

3.6 Urban land development in 1979-1985: a critical period

It was declared under article 31 of the new Constitution that each Iranian individual and family would have the right to a decent house. The government was to have responsibility for providing the ground for the implementation of this article, giving priority to those who were needy. Between 1979 and 1987, three laws concerning urban land were enacted in the Majlis (parliament) (see ULO, 1990; Dehesh, 1994:419). In June 1979, the Urban Waste Land Ownership Abolition Law (UWLOAL) was enacted by the Majlis (parliament). According to this law, all urban waste lands became public lands. The ownership of all waste lands (unused lands) was abolished and restricted to a maximum 1,000 square metres retained by land owners who did not own a house. The second law was the Urban Land Law (ULL), enacted in 1982 for five years. According to this law the ULO could possess "Bayer" land, which was currently unused land, but with a previous history of development. In addition, according to article nine, the ULO could possess "Dayer" or farms in 32 cities. These cities were those which had housing and land problems. The third was the revision and enactment of a new ULL in 1987.

The main objectives of these laws were to provide land for housing, as well as land for other public uses, and to curb land speculation. The major points of these laws were restricting the amount of land by landholders, prohibition of land transaction except to, or from the government, and the establishment of provincial Urban Land Development Organisations (ULDOs). The duties of the provincial ULDOs were transformed to the newly established ULO in 1982. Between 1982 to 1992, 329,952 hectares of land were acquired and over 17,044 hectares of net residential land were distributed between applicants (ULO, 1992d:10,16).
Another achievement of these laws was the establishment of a Housing Foundation which can be seen as a step towards housing for the poor. As mentioned earlier, massive housing construction in the immediate post-revolutionary period took place in Iran. Low income earners could not afford the legal fees for the purchase of affordable residential land in Iran as in other developing countries. Therefore, the foundation aimed to provide housing for such people. Furthermore, the financial activities of banks in the immediate period after the revolution contributed to the immense increase in housing stock. Iranian banks granted large amounts of loans for home buyers. For instance, the Melli Bank of Iran allocated US$1 billion for this purpose, an amount three times greater than that authorised. Housing production through the activities of the Housing Foundation and banks contributed towards more urban expansion (see Mowlazadeh, 1991:132).

It may be suggested that from the point of accessibility to urban land, especially by the poor, the policies of urban land assisted low-income families as well as supplying land for social services. Previously the supply of land for public facilities such as schools, health centres, administrative buildings, parks, open spaces and sports was one of the problems of urban development. Further, the implementation of most plans was hindered by private land ownership. Therefore, public land ownership, as a result of the urban land policies, solved many of these problems. However, these policies resulted in a rapid urban expansion. Before the revolution migrants were attracted to the cities by better job prospects as increased oil prices encouraged large scale industry and expansion of the service sector. In the immediate post revolutionary period rural-urban migration was accelerated as migrants anticipated that the government would distribute land or housing to them free of charge or at a cheap price. Land owners began to sell their land, sometimes at a reduced price. These migrants joined the land applicants' queue hoping to get free or low priced land.
The ULO's land distribution created large new urban residential areas within a short period of time and gave rise to many problems. New areas were inadequately planned. While each subdivision could be on the basis of a comprehensive plan, at the start of the ULO activities, many cities did not have these basic plans. Furthermore, much of the most suitable land was located outside the boundaries of master plans. The ULO also had to cope with huge housing demand in the cities through the distribution of acquired land. Therefore, subdivision of public lands was undertaken without adequate planning, with the effect that land was developed unfairly.

Prior to 1985, the ULO planners had prepared plans for new urban areas. Sites with less than 100 residential allotments were decided locally, whilst those exceeding 100 allotments had to be approved by the central ULO in Tehran. However, owing to the non existence of master plans and the large amount of land to be developed, it could not cope with rapid expansion needs. In other words, organisation and grading of planning were major obstacles. The subdivision of land for development projects demanded two stages. Firstly, the overall distribution of land uses must be laid out. Secondly, before housing construction, the detailed plans such as the levels of plinth and ground for dwellings and roads, were determined; therefore, the detail plan was essential to avoid problems. However, during the period 1979 to 1985 the ULO neglected the second stage of planning, leaving the responsibility of details to the relevant municipal councils. For example, consideration was not given to plinth and ground levels, so the majority of new residents suffered from the consequences of construction. This happened in many cities in which distribution of land was undertaken by the ULO.

The most critical problem faced at this time was that the provision of infrastructure for new areas was not seriously considered by these organisations and so the servicing of massive new buildings was uncertain. As noted above, on the basis of UWLOAL, the ULDOs were formed in each province, but despite their official titles they were largely
concerned with land transactions rather than land development. They administered acquisition and distribution among eligible applicants of nationalised lands. The ULO's responsibility for urban land development also ended with the distribution of land. For a variety of reasons, infrastructure provision was often very expensive, of low quality, and subject to delays. When applicants finished building and needed infrastructure, they had to arrange for its provision from various governmental organisations, including city councils (for roads), and from water and electricity boards. In response to these problems, the Ministry of Housing and Urban Development initiated the new urban land development policy in 1985. A full examination of this policy is undertaken in Chapter Five and Eight.

3.7 Conclusion

The trend of rapid population growth in the last few decades suggests that population growth will be the dominant demographic characteristic that will affect housing demand in the future. Some improvement in overall housing conditions have occurred in recent years. Overcrowding levels have decreased and the quality of housing has improved. However, the relative improvement in housing conditions during the period 1976 to 1986 did not resolve housing problems permanently. Absolute housing shortages still exist and the general demand for housing will not fall because Iran's population is not expected to decrease dramatically. The number of dwellings containing more than one family adds to the significant problem of overcrowding. On the other hand, relative improvement in housing conditions, such as increase in housing production, has been a major factor contributing towards more rapid urban expansion. The key indicators discussed above reveal that Iranian cities are spreading rapidly and, without an effective policy for urban land development, the conditions experienced in the future are likely to deteriorate.

The examination of pre-revolutionary urban development reveals several problems, including a lack of effective regional planning, failure of master plans in term of
implementation, and failure in infrastructure provision. During 1979-1985, the country also confronted serious problems in urban land development. The distribution of mass raw land by the ULO contributed towards more urban expansion without adequate infrastructure or consideration of environmental issues, resulting in the development of shanty towns. A positive response to both the extent of housing demand and the need for sustainable development is dependent on the provision of land and infrastructure, with associated environmental protection and enhancement which are discussed in Chapter Four. Chapter Five examines the outcomes of the new urban land development policy in response to these problems at the national level, and Chapters Six, Seven and Eight examine these issues in detail in the case study.
Chapter Four
EVALUATING URBAN LAND DEVELOPMENT
INFRASTRUCTURE AND ENVIRONMENTAL ISSUES

4.1 Introduction

As noted in Chapter One, this study assesses for the first time various outcomes of the urban land development policy of 1985 in Iran. The first section of this chapter explains the process chosen to evaluate the policy experience over the first decade of its implementation. Evaluation criteria regarding effectiveness and equity outcomes are discussed. The second section deals with environmental concerns and the specifications surrounding sustainable development, including relationships between site selection and environmental conditions. Some common physical elements of the environment, such as water supply, sewerage and drainage systems, roads, as well as physiographical issues are also discussed.

4.2 Evaluation of effectiveness and equity considerations in urban land development

Evaluation procedure

To improve the quality of decision-making regarding urban land development, an evaluation of the policies should be carried out to identify whether or not objectives have been met. Monitoring and evaluation of policy is important because it checks whether the implementation of strategies is adequate at various levels. In other words, evaluation checks on whether the strategies themselves are effective and
appropriate for achieving the objectives for which they were designed\(^1\). It is thus surprising to discover that a post evaluation study is almost absent in the area of urban land development policy. Part of the reason is found in difficulties in collecting and analysing appropriate data but mostly it is caused by a lack of accountability on the part of the government towards its urban clientele.

There are several evaluative procedures, such as impact evaluation; evaluation of program management; process evaluation; design evaluation; and evaluation for development (Owen, 1993:21; Schaanman, 1976). This study employs a policy evaluation procedure which involves measuring the impact of policies on declared goals. However, policy documents are more likely to put forward generalised objectives than to specify the means of implementation, such as the overall objectives contained in the urban land development policy in Iran (Table 1.1 in Chapter One). Policy objectives usually provide broad ways in which the process of action is not assigned. In this context, Wildavsky (1972:21) points out:

*Objectives are not just out there, like ripe fruit waiting to be plucked; they are man-made, artificial, imposed on a recalcitrant world. Inevitably, they do violence to reality by emphasising certain activities (and hence organisational elements) over others. Thus the very process of defining objectives may be considered a hostile act. If they are too vague, no evaluation can be done. If they are too specific, they never encompass all the indefinable qualities that their adherents insist they have. If they are too broad, any activity may be said to contribute to them. If they are too narrow, they may favour one segment of the organisation against another.*

It is essential, therefore, to select workable normative criteria in evaluating the success or failure of Iranian urban land development policies. In order to address the research questions and select appropriate criteria for evaluation, it is necessary to approach them with conceptual frameworks that have been developed in the past.

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\(^1\) For a discussion about various reasons for evaluation, such as achievement; measuring progress; improving monitoring; identifying strengths and weaknesses; cost benefit; collecting information; sharing experience; improving effectiveness; and, allowing for better planning, see Feuerstein (1986).
McAuslan (1992) suggests that at least five key issues need to be considered: attitudes regarding land derived from historical, cultural, religious, and legal circumstances; structure, function and roles of government; procedures for land transfer, permission for land development, and land acquisition; the role of the private sector; and the overall role of the law. On the basis of these key issues, McAuslan has categorised the principles into two orders. "First order principles" are concerned with the decision to proceed, and include: (1) *muddling through*, which deals with the ways in which bureaucracies react to events, try to accommodate diverse and conflicting pressures, juggle inadequate resources, and try to make sense of confused aims; (2) *incremental change*, which concerns issues of small scale cost-effective programs, and reform; and (3) *fundamental reform*, consisting of a planned program and forming the basis for the operation of an economic, efficient, and equitable land development system. This last principle also covers the questions of tenure conversion, allocation, transfer, regulation and use.

"Second order principles" are: (1) *equity*, in order to preserve the right balance and consideration of the urban poor; (2) *flexibility*, which concerns accommodation of change and growth; (3) *environmental consciousness*, which integrates the environmental concerns into urban land development; (4) *participative and easy management*, which concerns consideration of the urban majority through local-help schemes; (5) *simplicity*, which concerns being understood by all; (6) *efficiency*, which concerns cost efficiency of urban land development through appropriate development control tools; and (7) *administrative fairness*, which concerns issues such as prompt compensation, and internal checking on planners and administrators. Finally, the following linear model is suggested:

Survey---------Analysis---------Plan---------Implement---------Feedback
To make the evaluation of outcomes from Iranian urban land development policy more manageable, important aspects of the policy need to be selected for examination. In this respect, achieving objectives such as popular participation, creating jobs, good design, prevention of irregular settlements and private sector participation, are relevant. However, it is beyond the scope of the present study to look at all the policy objectives suggested by McAuslan. Three areas, land supply, infrastructure provision and environmental considerations, were chosen as key priorities for the following reasons. Firstly, as noted in Chapter One, this single study is the first attempt towards the analysis of the new policy. Thus, it is essential to provide at the outset a detailed picture of the policy environment in which some of its outcomes are to be assessed. This necessitates a more comprehensive introduction to the new policy and the land development process than would usually be contained in an evaluation of specific outcomes.

Secondly, as shown in Chapter Three, Iran has experienced a tremendous urban population growth in which sufficient land supply became a major concern of urban land development policies. The provision of basic infrastructure, as well as an emphasis on environmentally sustainable development in order to prevent the growth of shanty towns, are also essential as basic policy objectives. Furthermore, it is notable that most of the objectives of the new urban land development policy shown in Table 1.1 focus on land supply, infrastructure provision and environmental concerns. Other factors contributing towards simplifying the evaluation in this way were time and financial constraints faced by a single researcher. The three important principles concerning urban residential land development selected for detailed examination in this study were thus measures of effectiveness, equity and environmental quality.

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2 For the purpose of this study, these terms have special meanings which were defined in Chapter One. They will be also elaborated later in this chapter.
Effectiveness

Urban land development policies cannot be effective if implementation falls behind the pace of rapid urban growth and does not take place in conjunction with housing construction. As noted in Chapter One, regarding the effectiveness of urban land development policies, three issues were selected to be examined, including the provision of sufficient land to meet housing demands; the provision of adequate basic infrastructure in the key areas of water, electricity, roads, sewerage and drainage systems; and financial participation of people through their contribution towards the costs of development.

The issue of land supply, including problems, policies and response, was discussed in Chapter Two. In addition, according to the post-revolutionary urban land policies discussed in Chapter Three, urban land was largely supplied through public land. The effectiveness of these policies are considered in this study through the analysis of demand and supply in the study period, 1985-1992 at both national and local level in Chapters Five and Eight. However, a most crucial aspect of the policy effectiveness is considered in terms of infrastructure provision.

Although some housing indicators in Iran, such as floor space per dwelling and per person indicated in Chapter Three, are much higher than found in many other developing countries, they do not ensure that the housing is necessarily adequate. Basic infrastructure and public facilities are essential physical elements that can determine whether a house is an adequate space for living. In most areas, the shortage of land was not the binding constraint on city expansion but it was a shortage of serviced land, that is, land with access to basic infrastructure, which inhibited expansion. Thus, an effective land development policy must provide infrastructure
and facilities at the same time as construction of housing in the new subdivisions³. Failure to achieve this, results in shanty town developments experienced in the immediate post-revolutionary period in Iran.

As will be discussed in Chapter Five, the new urban land development policy in Iran experienced a long process of implementation. In this context, several issues may be raised, including institutional arrangements, co-ordination between various government departments and agencies concerned with water, waste, electricity, gas, road, and telephone⁴, and privatisation⁵.

As discussed in Chapter Two, financing of infrastructure is becoming increasingly important and much of the literature is focused on this theme. Traditionally, governments have had the chief responsibility of managing the process of infrastructure provision, particularly funding. However, a rapid rise in construction costs, changing economic conditions including reductions in national income, particularly after the economic recession of the 1980s, fiscal decline of cities, tax

³ For a discussion about various factors, such as co-ordination of agencies and financing problems causing delays in infrastructure implementation, see (Bamberger, et al. 1982:91; Darin-Drabkin, 1977:182).

⁴ The nature of co-ordination is a complex issue everywhere because of the need to negotiate with a variety of departments. Even in a more developed country, such as the United States, the policies concerned with co-ordination and how to deal with the private sector responsibilities have been a problem particularly in growth areas (Catanese cited in Stein, 1988:83 and 92).

⁵ Privatisation, is introduced as an alternative strategy for infrastructure development, using a wide range of approaches. Variations in the extent of privatisation are much greater than to be discussed here. The major argument behind privatisation is that while a monopoly provision of services by governments may give rise to problems, profit motives and competition in the private sector result in efficiencies (Sharp, 1990:101, 103, 110; see also Roth, 1987:2; Feldman, et al., 1988:95; Kirwan, 1989:295; Nelson in Stein, 1988:120; Archer, 1989:307-309; and Sharp, 1990:6). Nevertheless, debates still exit over the merits of public sector provision of infrastructure and the merits of privatisation (see Feldman et al., 1988; Snyder and Stegman, 1986:53). For example, Feldman et al. (1988:3) point out "only the public sector can effectively co-ordinate infrastructure projects that are a part of a larger system, such as national road network or a regional water supply."
and expenditure limitations, and growth in the size of the government workforce and public bureaucracy, are some of the reasons for the reduction in national aid for infrastructure. All these factors affect the urban conditions of many developing countries, particularly a reduction in governmental expenditure on urban infrastructure. Examples are found in Brazil, Mexico, Morocco, Indonesia and the Philippines (Gilbert, 1992:437).

In Indonesia, for example, public expenditure on urban infrastructure has been reduced because of declining revenue from oil production. While this country has recently experienced rapid growth, providing urban infrastructure has been a major concern of the Indonesian National Urban Development Strategy. The country initiated the Integrated Urban Infrastructure Development Program (IUIDP) in 1985 to meet its needs (see Steinberg, 1991). However, as Steinberg (1991:18-22) argues, the Indonesian program was an 'enabler' (facilitator) program rather than a program aimed at providing all resources and services. In spite of the fact that it was six years since implementation of the new policy (up until 1991), it was recognised that financing still remains a major and indefinite problem (Steinberg, 1991:18-22).

In Iran, as noted in Chapter One, the Ministry of Housing and Urban Development introduced user-pays in 1985 to finance the provision of basic infrastructure in new urban residential areas (this will be elaborated in Chapter Five). The user-pays system in Iran is defined as a policy of recovering public investment costs through generating capacity from all users. In some developing countries, such as Jamaica, developers are required to pay the full costs of local infrastructure, including water, roads and electricity, and also of public facilities, including schools and health clinics (Habitat, 1990:80). According to the Iranian user-pays system, however, residents had only to pay the costs of infrastructure at the local level. In other words,

6 For the definition of terms 'user charges', 'user fees' and 'user payments' see Snyder and Stegman (1986:14) and Downing (1973).
the cost of on-site infrastructure, such as local roads, water and electricity reticulation were to be provided by the users, and off-site infrastructure such as highways and transfer lines were to be provided by the public sector.

Regarding the effectiveness of the new policy in terms of infrastructure provision based on a user-pays system, several key issues must be considered. In the Iranian user-pays system, cost-recovery is found to be the first and most important issue to be evaluated in terms of effectiveness. Obtaining enough funds at the right time could enable the MHUD to fully implement projects. Therefore, cost-recovery analysis becomes a key issue in consideration of policy effectiveness for infrastructure provision as a whole. As will be investigated in Chapter Five, many urban land development projects in Iran are implemented under different conditions, with projects being of various scales and undertaken in cities of different sizes. Furthermore, their location and physical conditions have also varied widely. Consequently, they present different results in terms of cost recovery analysis. In this context, issues such as economies of scale and the relationship between city size and the cost of infrastructure provision are relevant (see Richardson, 1973:85; Gugler, 1988; Herington, 1984:22; and Henderson, 1988). The importance of the relationship between city size and the cost of infrastructure provision, for example, is noted by Richardson (1973:126):

. . . it is sometimes argued that urban development and infrastructure construction costs are lower in medium-sized towns which offer the economies of scale and accessibility to building material sources frequently not found in small centres yet do not suffer from the high costs of development in large cities.

**Equity considerations**

When considering the aims of the urban land development policy as shown in Table 1.1, equity is not referred to specifically and is significant by its omission. Questions of equity are complex and require separate definitions on each occasion the term is
used. Some scholars argue that *fairness* (the Macquarie Dictionary definition of equity, as noted in Chapter One) depends on one's concept of fairness. While some argue that everyone should receive the same income, others say that diligence is much more important in the distribution of income, as derived from the workings of competitive markets (Mansfield, 1974:520). Mansfield (1974:513) points out, that "because we cannot make interpersonal comparison of utility, we cannot tell whether one distribution of income is better than another" (for a discussion on the principles of *justice* see Rawls, 1971:60). Miller (1976:27) suggests that there should be three principles of justice, individual 'right', 'desert' and 'need', and argues that "... the conflict between these principles is not symmetrical, and here the simpler division between conservative and ideal justice should be borne in mind". Sharp (1990:131) argues that one cannot come to a conclusion about equity because of the lack of agreement on appropriate standards for its evaluation. Nevertheless, there should be equity in terms of not disadvantaging the urban poor, as the World Bank (1991b:47) states:

*In most cities in developing countries, large proportions of the total population live in informal settlements where structural problems exist concerning the access of the poor to essential services. Rigid regulatory regimes and deficient infrastructure have historically had their worst impacts on the poor. Regulations often give the poor no alternative to informal settlements and limit access to basic services.*

Post-revolutionary urban land policies in Iran7 (not urban land *development* policies) may be readily analysed and challenged from an equity point of view according to its common definitions. In such an analysis, issues such as the principles of compulsory land acquisition by the public sector, compensation to former

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7 These are not the focus of this study. As discussed in Chapters One and Two, researchers including Mowlazadeh and Majedi have undertaken such analyses on post-revolutionary urban land policies in Iran.
landowners, and allocation of public land to applicants would be raised. However, in the context of urban land development, as noted in Chapter One and for the purpose of this study, equity will be defined in two ways; (1) the provision of basic infrastructure by government as basic need; and (2) the affordability of infrastructure by users.

The first aspect of equity in the evaluation of the Iranian urban land development policy relates to objective number 4 (Table 1.1). The Ministry of Housing and Urban Development states: "to economise and, eventually, to eliminate the governmental expenditures in the urban services section and to direct this capital towards education and production". However, it can be argued that infrastructure items may generate external benefits for the wider society, not only for the direct recipients. Although education and production in their broad ways benefit the whole society, basic infrastructures can be also seen as basic needs (Sharp, 1990:8; Snyder and Stegman, 1986:14). Water is essential for public health and its availability increases economic development. Sewerage systems are also vital infrastructure for the whole community. This study evaluates the extent of policy success in the provision of infrastructure to meet people's basic needs. In other words, equitable land development should provide adequate infrastructure for the community. For example, although the major part of McAuslan's discussion on equity is about land issues, he also emphasises that access to basic infrastructure is an equity issue: (1992:25)

*The system should aim to contribute to righting the present imbalance towards the well-off in most urban development processes. It should be made easier to acquire lawful title to land or lawful occupation of a home, funds to build a home, as well as to comply with any regulatory provisions*

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8 One of the principles, for example, used by Mowlazadeh (1990) to examine post-revolutionary land policies was equity in terms of land acquisition and land allocation.
The second issue in relation to equity is considered in terms of affordability. In undertaking a user-pays system, the financial status of new consumers must be considered. Most land applicants are middle to low-income people and would find it difficult to afford infrastructure costs. An indication of this can be seen in the regulations concerning land allocation. As noted in Chapter Two, according to the regulations of Urban Land Law, land applicants must not own any housing. There are large differences between governmental land prices and the free market prices, resulting in many of the government land applicants selling their lands (illegally) or housing after construction (see MHUD, 1988a:2 and 42; ULO, 1992d:51). Therefore, with particular reference to the people involved, the success or failure of the policy will be evaluated in terms of affordability. It will be analysed through an evaluation of payments by initial applicants for which official data is available. A profile of the financial status of land applicants is also drawn from statistics available at the local level.

4.3 Environmentally sustainable development

The need for sustainable development

The second area requiring attention is the emerging environmental crisis resulting from rapid urban expansion, as discussed in Chapter Two. The relationship between urban development and the environment, and the understanding of the impacts of development and expansion on the environment are important and complex issues. On the one hand, environmental factors are significant forces that affect urban development and can constrain or promote development. The initial location and the form of each city are largely determined by the natural environment and resources such as agriculture, fishing, coastal locations, climate and minerals. On the other
hand, urban development activities have various positive and negative environmental consequences and demands on natural resources. The World Bank (1992a:25) states "without adequate environmental protection, development will be undermined; without development, environmental protection will fail".

Environmentally sustainable development is probably one of the most complex and challenging issues facing urban areas today and the concept of sustainable development is a new challenge to the development process. It is even more important in urban areas, where the dominant places of population distribution exist and production and consumption of goods and services take place. The World Bank (1992a:34) defines the term "sustainable development" as "development that lasts". Leman and Cox (1991:218) define sustainable development as:

...the process of equitable economic, social, cultural and technological betterment in a way that does not pollute ecosystems and deplete natural resources. Sustainable development implies the enhancement of human resources, the capabilities of communities to work towards economic, social, technological and cultural enhancement... Sustainable development cannot occur in any country without carefully taking into account its human settlements. Initiatives cannot be successfully undertaken in ensuring the sustainability of a country's agriculture, forestry, fisheries and industries without addressing the context of the system of human settlements in which they occur.

MacNeill et al. (1991:197) suggest that environmental considerations necessitate less energy use per capita and per unit of production, less water, less land, less resources, less chemicals, less waste products, less pollution (air and other types). They suggest however that some of these goals can be achieved in developing countries as the elements of sustainable development, but improving urban infrastructure remains a critical issue for financial and technical reasons. The principles of environmentally sustainable development are fundamental to the question of the extent to which cities are expanded. Leitmann (1993:31) suggests that the factors causing the complexity of environmental management are as follows: "(a) the frequently large number of factors per problem area; (b) cross-
jurisdictional conflicts; (c) central-local conflicts; and (d) tension between forces for centralisation and devolution of authority". World Bank (1991b:52) points out:

Assessment of the underlying causes of urban environment problems is the important first step in designing strategies to address them. Some causes, such as rapid population growth are fundamental. Others involve inadequate preventive action through economic policy and management measures such as (i) inappropriate economic policies (e.g., underpricing of water and other services), leading to resource depletion and higher levels of pollution and (ii) inadequate land use control or inappropriate land tenure systems that hinder effective land use or lead to overregulation of land markets and force the poor to occupy marginal lands.

To achieve a sustainable balance between the level of population and potential resources, it is necessary to reverse the trend of population growth. However, to what extent is this possible? Population growth increases pressure on existing resources. Over-using farmland, polluting water supplies and cutting down the forests are some of the results of degradation. In order to approach an environmentally sustainable development, the World Bank (1991b:12) suggests the following requirements:

- Raising global awareness of the urban environment crisis, in order to develop political support for action.

- Improving the information base and understanding of the dynamics of environmental deterioration in urban areas.

- Developing city-specific urban environmental strategies that respond to the circumstances of individual cities.

- Identifying programs of curative action for cities to redress the most serious environmental consequences of past public policies and private behaviour.

- Formulating effective national and urban policies and incentives to prevent further environmental deterioration.

Different development patterns can have a significant impact on the environment. The relationship between density and environment, for example, is an important
issue that varies according to different development patterns. Increasing the density may have different impacts on the environment. While this increase may protect the environment of the fringe areas, it may increase the problems of inner cities. In high density areas where the number of persons per room is higher than normal standards - such as slum areas -, it puts heavy pressures on shared facilities in dwellings. Poor quality housing, substandard construction, building in flood zones and building in earthquake-prone areas or areas vulnerable to natural hazards are also important issues. In this context, site selection becomes an important issue as is discussed below.

Site selection and the environment

Several scholars have suggested criteria for site selection. Pacione (1990b:222) suggests the following considerations to be taken into account when selecting sites for private residential development: size of site; topographic conditions; conditions of sub-soil; existing ground cover; clearance grant; neighbourhood social class; access to city centre, proximity to local shops; access to employment; access to schools; physical environmental quality; site availability; basic services; price of land; and market factors. The influence of the market, size of site, planning permission and the availability of basic services such as water supply and sewerage play significant role in site selection (Bather in Pacione, 1990b:222). Two important questions should be taken into account when considering the attitude of the private sector: firstly, whether the land is physically developed; and secondly, whether it is marketable. Costs of land, infrastructure installation, building materials and labour are major concerns which vary in different sites (Pacione, 1990b:220). However, in countries such as Iran where public land ownership dominates, the major issue concerns the suitability as opposed to the availability of different sites.

Although most of these criteria apply to site selection by the private sector for the purpose of residential development, many of them can be used in selecting public
residential development sites. Some of these criteria are related only to the private sector and others concern both public and private sector development. Public land ownership is not concerned with some criteria, such as planning permission, land price and market factors. Furthermore, accessibility to public facilities such as schools, local health centres and shops is not important in large sized projects due to their incorporation into large development projects. This issue is taken up in Chapter Five.

Zube (1980:7) suggests that seven environmental goals are considered in environmental evaluation: health, safety, productivity, natural process, accessibility, aesthetics and satisfaction. He points out that three types of standards exist. Firstly, some goals, including health, safety, productivity and natural processes should be achieved through professional judgement. Secondly, satisfaction is the product of user perceptions and experience. Thirdly, others, including accessibility and aesthetics, are derived from a combination of both professional judgements and user perceptions.

Leman and Cox (1991:222) suggest six common elements for sustainable development, including: consideration of non-renewable resources such as increasing densities for land conservation and providing mass transit programs; resource substitution by the replacement of non-renewable resources with renewable ones, changing energy patterns; resource rehabilitation, such as the rehabilitation of coastal zones, wetlands, aquifers, forests and wildlife habitats; recycling of waste materials in a broader range; control and treatment of waste emissions; and management of non-recyclable waste.

Both regional climate and microclimates of a given development area can influence environmental costs and site selection. To take the best advantage of a site, a study of a microclimate is needed before site selection. As the result of the interaction of a range of factors (temperature, humidity, wind, solar radiation and precipitation)
various climatic conditions emerge. For example, in measuring rainfall, items such as average daily rainfall, seasonal and annual ranges, and extremes are all relevant data. For wind, items such as direction and intensity are considered. For humidity, seasonal and annual variation and daily range are items to be considered. Temperature needs to be considered in terms of daily high, low, average, and seasonal. These items affect housing and patterns of urban land development. Climate factors affect selection of building materials. Prevalent winds and meteorological conditions cause residents to be exposed to different levels of air pollutants. These factors result in health and productivity losses, as well as affecting design, development and building orientation.

Physical environment

As noted earlier, this study focuses on the physical environment including basic infrastructure. On the basis of considerations discussed above, the physical environmental elements including water supply, sewerage systems, physiography, roads and drainage systems are discussed here.

The way that water is supplied and distributed is an environmental issue, having significant effects on residents. Water is supplied from different sources, including underground water and rivers, and is transferred to the point of consumption. Using polluted water for drinking is a principle cause of infectious diseases. According to a World Bank report (1992a:4), over two million people die in a year from diseases attributed to water pollution and water scarcity in the world. While access to safe water remains an urgent human need, a number of factors determine the quality of water resources including chemical pollutant levels in surface and groundwater.

Underground water resources are important sources of potable and industrial water in many cities, including those in Iran, which may be threatened by industrial, solid and human wastes. Inadequate protection of these waters may cause serious health
problems. Underground water contamination together with poor management of the sanitation systems results in water pollution causing negative health effects. Furthermore, over exploitation of supplies may be a vital problem in meeting drinking water standards. Seepage from improper use and disposal by heavy industries, particularly chemical industries, are principal factors causing groundwater pollution. In the cities of Jakarta, Katowice and Tianjin, some methods, such as desalinisation and recharging of aquifers, have been used to decontaminate groundwater (Leitmann, 1993:47).

Roads, drainage systems and flooding are other important physical environmental elements which need to be considered. The inadequate capacity of roads intensifies the negative effects of motor vehicles. Examples of these problems can be found in the cities of Jakarta, Bangkok, Tianjin and Tunis. In the city of Jakarta, while the annual population growth rate has recently been 2.4 per cent, the number of vehicles has increased 10-13 per cent per annum, whereas the surface of roads has expanded by only three per cent (Leitmann, 1993:55). According to the World Health Organisation (WHO), the acceptable level of air pollution is exceeded on average in cities seven days a year, but the cities of Tehran, Bangkok, Beijing, Calcutta and New Delhi experience more than 200 days a year above acceptable air pollution standards (World Bank, 1992a:50).

Furthermore, inadequate road provision results in traffic congestion which further aggravates the problems of air pollution. Inadequate drainage systems and flooding control jeopardise human safety. Flooding may occur naturally, or may be the consequence of uneven land development. The location and design of land development projects may affect the extent of flood damage. Flood-prone areas are not suitable for residential development unless they can be used for other functions such as parks (see Keyes, 1976:9,51).
The last element to be considered is physiography. Steep slopes, for example, affect the design of housing as well as infrastructure elements such as water distribution. Physiography affects the infrastructure costs of development projects through soil movement and patterns of drainage and water supply. The implications of site conditions on the environmental costs of development need to be analysed. These conditions include soil, ground cover, water sources and climate (for detailed discussion on site issues see Lynch and Hack, 1984:29-66; Lampert and Woodley, 1991; Beer, 1990). Basic physical elements are fully examined in the case study sections of this study in Chapters Seven and Eight.

4.4 Conclusion

The improvement of the quality of urban development can be achieved through evaluation studies. In Iranian land development policy there has not been feedback in order to consider the outcomes of policy implementation. Effective urban land development should adequately provide basic infrastructure in new residential areas, including water, electricity, roads and sewerage systems. Because of the nature and significance of the provision of infrastructure for new residential areas, it should be a program priority at the national level. In the context of a user-pays system, an important issue concerns the financial ability of consumers to pay. If those who cannot pay are deprived of access to vital services, the result is not equitable.

In terms of environmental criteria, appropriate patterns of development and site selection are needed to approach environmentally sustainable developments. Urban land development programs should consider the creation of maximum benefits in both the short term as well as the long term. Moving towards environmentally sustainable development will mean changes in patterns of resource use and improvements in the way in which safe water is supplied, sewerage is treated, and roads, electricity and drainage systems are efficiently provided.
Within this framework, the next part of the study proceeds to an evaluation of urban residential land development policy in Iran. The next chapter will examine the new policy at the national level in a range of modes, from the initiation of the policy to its effectiveness to provide infrastructure and supply land. Chapters Six, Seven and Eight will proceed to a detailed examination of policy implementation in the case study area.
Chapter Five

AN EVALUATION OF URBAN RESIDENTIAL LAND DEVELOPMENT POLICY IN IRAN
A NATIONAL PERSPECTIVE

5.1 Introduction

As noted in the previous chapters, rapid population growth together with rural-urban migration has produced a very high demand for housing and urban expansion in Iran in recent decades, particularly in the period post the revolution of 1979. Huge public land distribution in this period resulted in the crisis of rapid urban expansion. The Ministry of Housing and Urban Development (MHUD) was concerned that if this expansion of the cities were not handled with care and attention, new urban areas were likely to be characterised by slums and shanty towns. Therefore, in 1985, it initiated a new urban land development policy to cope with these problems. This new policy had a set of broad objectives, the aims of which were to address a range of issues, as discussed in Chapter One.

This chapter aims to evaluate the outcome of the policy implementation at the national level. This will be pursued by providing firstly a description of the policy including institutional arrangements, the process, non-governmental land development and financing new land development projects. In the second section of the chapter, an empirical evaluation of the new policy at the national level is undertaken in which the effectiveness of the implementation of the new policy is examined. The first part of the discussion aims to establish the general context of the policy approaches to the provision of infrastructure for new urban residential areas. It includes an examination of cost recovery in the provision of urban infrastructure based on a user-pays system, and impacts of various factors on this system are
discussed. The second part deals with an investigation of the effectiveness of the new policy of sufficient land supply.

5.2 The new urban land development policy of 1985

As discussed in Chapter Three, the Urban Land Organisation (ULO) was initiated under the new post revolutionary land policies in Iran. The ULO acquired large amounts of land which provided approximately 50 per cent of the land used for housing construction in urban areas until the initiation of the First Five Year Plan in 1989. Responsible governmental organisations had difficulties in coping with rapid urban expansion. The post-revolutionary urban expansion was generating shanty towns, with the result that the management of land development was one of the most important problems of the cities faced by the government. Therefore, in the context of rapid urban expansion, land development became a major issue. Many of the problems of the period 1979-1985, which were discussed in Chapter Three, can be traced directly to the absence of a policy concerning the provision of infrastructure and an effective policy was deemed to be necessary. The problems arising from the conditions of the period 1979-1985 necessitated the formulation of realistic land development policy that could provide a means of regulating the physical expansion of urban areas and the required infrastructure services. Apart from financing the provision of infrastructure, the whole process of the direction of urban expansion and urban land development in new residential areas became the responsibility of the MHUD.

Institutional arrangements

According to the regulations of the new policy, all public land was to be planned and proper infrastructure was to be provided before distribution of plots to applicants for housing construction. Until 1987, the plan was implemented as an internal policy of
the MHUD. In 1987, the plan became a parliamentary law. Article number 11 of the Urban Land Law (ULL) of 1987 reads: "The MHUD is responsible for developing its own lands (public lands) and allocating them to applicants on the basis of the country's public policy and the Cabinet Regulations of the Urban Land Law".

In 1988, the regulations of the ULL were approved by the cabinet in which a separate section was allocated to urban land development. Then, the guidelines of urban land development were prepared and communicated to the Department of Housing Affairs (DHA), Urban Land Organisation (ULO) and provincial offices for implementation. One of the major objectives of this policy was to equip urban land with sufficient infrastructure before the provisional housing. Providing road networks and asphalt, water reticulations, electricity and sewerage systems for all new residential land development projects became the initial objectives. Article number 41 of this regulation defines land development as:

*Land development means a collection of activities in which land is prepared for housing and includes (a) basic infrastructure such as surfacing roads and asphalt, water and electricity supply, the systems of sewerage and surface drainage; (b) public facilities such as schools, health centres, police and fire stations, parks and commercial spaces.*

For public facilities such as schools, health centres, parks and sport centres, guidelines were prepared and communicated. According to these, commercial lands could be constructed and sold on the basis of the higher tender. Public facilities were to be funded from income thus procured (for details on this issue see Azizi, 1995b).

Until 1987, the DHA had managed the new projects but when the number of projects increased, in 1987, a special office entitled the 'Land Development Office' was established to manage the ever increasing number of projects. The main duties of the new office involved drawing up agreements and communicating with the provincial authorities for implementation; allocation of revolving funds for each project; information banking; contributing towards the selection of consultants; and the communication of approved plans and maps to the provincial offices. Furthermore, a
technical committee was established under the supervision of the DHA, to consider and approve consultants' plans and maps for projects larger than 10 hectares (the projects less than 10 hectares were considered in provincial offices). This committee's membership was drawn from various departments such as the ULO, the Department of Architecture and Urban Planning, the DHA and the Technical Department. In addition, there were representatives of the provincial offices on the committee. In order to coordinate this committee and the administrative process, the general director of the office also acted as secretary of the committee. To cope with the financial circulation of the new projects, a special group from the Department of Financial Affairs of the Ministry was involved (see Appendix 2 for details).

*The process of urban land development*

The implementation of urban land development plans was a long and complex process. The draft agreement of all projects together with provincial housing approval and other documents were prepared in the provincial offices of the MHUD and sent to the DHA in Tehran. The DHA considered and prepared the final agreement for signing and communication for implementation. An overall flow chart of the process of urban land development is presented in Figure 5.1. The four major stages, which are considered below, were site selection, plan preparation, execution and distribution of plots.

In the beginning of the implementation of the new policy, site selection was not considered as a separate stage, whereas it is an important issue in the process of urban land development. Four reasons can be suggested for this. Firstly, many cities did not have master plans. Secondly, much of the ULO's lands were located outside the boundaries of cities' master plans. Thirdly, the plans prepared for small cities were only useful as broad indicators for development and expansion. Fourthly, the proposed period of many of the previous master plans had already finished and new ones had not been prepared (usually they were prepared for a period of 10 years).
Figure 5.1 Flow Chart of Urban Land Development in Iran, 1985-1990:

Site Selection

Preparation of Draft Agreement in Provinces

Approval of Agreement in Tehran

Selection of Consultants for Planning and Design

Plan Approval in Tehran for Projects Exceeding 10 Hectares

Allocation of Plots

Preparation and Approval of Detailed Plan

Contractor Selection

Infrastructure Execution

Distribution of Developed Plots: Ready for Building Construction

Source: Adapted, summarised and translated from five flow charts, MHUD, 1988a:37-41.
years). However, the importance of the site selection process was recognised and in 1986, site selection for residential areas became a separate phase of the development process. Accordingly, by using consultant services, residential sites were selected for a 20 year period to respond to the needs of urban expansion.

The second stage of the process was the preparation of plans. This stage had been undertaken under two different conditions. If a city and the area to be developed had a detailed plan on the basis of an existing master plan, urban land development consisted of four activities including:

1. Subdivision of residential allotments and determination of densities;
2. Detailed design comprising roads, squares, green and open spaces, etc.;
3. Infrastructure including water, electricity, gas, telecommunication and sewerage;
4. Community centres including administrative, commercial, health, education and entertainment centres.

If the site was located in an area which did not previously have a master or detailed plan, a more complex planning process was required.

The third stage of the process was execution (implementation). Among the basic services for new areas, surfacing roads, asphalt, surface drainage and sewerage systems were usually provided by private contractors and the MHUD had little difficulties in these cases. However, other services such as water and electricity had to be provided through other governmental organisations, or in a few cases by municipalities. With regard to co-ordination as one of the most important stages in the process of infrastructure provision, the first agreement regarding the provision of water took place between the Ministry of Energy (ME) and the MHUD in 1988. If new projects were located within a city's boundary, the ME agreed to provide water. The cost was 300 Rials for one square metre net residential land across the country. This amount was only for reticulation expenses so other costs were to be obtained
during the connection of service to dwellings. In cities where new projects were located outside the cities' boundaries, the ME agreed to coordinate with the MHUD provincial offices, either for direct provision or in technical process.

However, the implementation of this agreement confronted some problems. The first and most important problem concerned the different costs of the provision of water in different projects and different regions. The ME wanted to implement the projects on the basis of fixed expenses, while its provincial and local offices claimed amounts based on real differences in the costs of provision. Two reasons for this were as follows. First, the physiography of land, size and location of projects were factors affecting costs. The second reason concerned the institutional arrangements within the ME, in which regional and local branches were usually independent in finance. For provision of electricity, too, an agreement was communicated between the MHUD and the ME. In this case, each applicant had to pay 50,000 Rials directly to the local offices of the ME and the remaining costs were collected at the time of connection. This solved the problems experienced in the water agreement such as having different costs for different regions and projects.

The final stage of the process was the distribution of plots to applicants. The ultimate objective of urban land development was the distribution of plots with associated services among applicants. At the distribution phase, two stages were considered. First, the criteria for selection of applicants and second, the pricing of land. According to the regulations of ULL, applicants were selected by criteria such as household size and period of living in a given city (see also Mowlazadeh, 1991). The issue of pricing of land is discussed under the section of financing later in this chapter.

*Non-governmental land development*

For most of the period following the 1979 revolution there were less opportunities for the non-governmental sector to participate in the process of urban land development.
development. There were some institutions such as revolutionary foundations, co-operatives and banks as well as other individuals who had kept their land. For example, the ULO did not intervene to possess those lands or it did not need them. Therefore, in early 1988 guidelines regarding urban land development through non-governmental developers were prepared and came into operation.

However, there were three major obstacles to the participation of the non-governmental sector. Firstly, if the land-use of the given land was for services, the government and municipalities had to indicate that it was surplus to their requirements. Secondly, under sub article Number Two of the guidelines, one of the requirements for consideration of the development applications of non-governmental developers was a certificate showing that the land was surplus to government and municipalities' requirements. The third constraint in these guidelines was that the developers in the 32 nominated cities had to give 50 per cent of developed residential plots to the applicants introduced by the ULO. In this case, the price must be on the basis of the official governmental price plus 10 per cent investment interest. Therefore, this sector was most likely to be involved in cities other than the 32 nominated cities. However, these 32 cities included almost all major and large cities. Therefore, it can be argued that the policy had little impact on the participation of the private sector in the process of urban land development.

Another task regarding the participation of non-government sector in the process of housing construction and a little in urban land development was through article number 67 of the regulation of the ULL of 1987. This article allowed the ULO to allocate land to the private developers who were eligible to participate in the process of housing production. This mostly related to housing production and occurred within the land development projects. The implementation of this plan occurred through an agreement between the developers and the MHUD in which the developers could construct housing on public land and sell under some conditions.
However, as noted above, the plan was concerned with the process of housing production rather than land development.

**Financing new land development projects**

Until 1985, the public sector was responsible for providing the infrastructure for new residential areas. This was traditionally a standard policy in Iran and many other countries. As noted earlier, one of the basic aims of the new urban land development policy was to eliminate governmental expenditure on urban services. The MHUD became responsible for providing new infrastructure by obtaining funds from new residents in advance. Therefore, a user-pays system was initiated as an alternative method of financing new urban land development projects. In other words, the new urban land applicants were those who had to pay for the provision of associated infrastructure.

Two reasons can be suggested for the initiation of a user-pays system. Firstly, one of the most important problems of infrastructure provision were the financial problems faced by the public sector. The new revolutionary government was confronted with an economic crisis for several reasons including: fall in oil exports (from five million barrels in 1977 to under 700,000 barrels in 1981) and the war between Iran and Iraq. In this period, particularly in the immediate post-revolutionary period, municipalities had difficulties in controlling urban land development. In addition, economic conditions affected the provision of sufficient materials for housing and associated services. This affected the quality of dwellings and the visual environment. In this economic crisis period, the provision of related services depended on funds which were already constrained and needed for the ever increasing volume of housing construction. The user-pays system attempted to resolve this problem. Secondly, the government believed that public funds should be spent on more important projects at the national level than the provision of infrastructure for new urban residential areas (Objective No. 4 in Table 1.1).
User payments were made by instalment and based on the size of allotments and the financial ability of the applicants. For example, applicants who wished to obtain a large allotment had to pay by two instalments whilst those obtaining medium sized allotments could pay by three, and those obtaining small allotments paid by four instalments. The period of payments was between the time of allocation and obtaining the plots. The provincial ULOs, as the owners of these public lands, collected funds from the applicants and forwarded them to the central ULO. The ULO paid the Department of Housing Affairs (DHA), which was responsible for implementation of projects, and it, in turn, paid the provincial MHUD. Then, in turn the DHA paid the provincial MHUD offices to carry out the projects. However, obtaining funds from new residents was only possible when the allotments of subdivided lands were allocated to them. Therefore, revolving funds were needed by the MHUD for allocation prior to execution. A simplified diagram of this process is shown in Figure 5.2.

Article 11(3) of the Urban Land Law (ULL) stated that the price of land should not exceed official government prices at the time of distribution. However, if the cost of preparation of land exceeded these official prices, then the ULO could sell the land on the basis of the final costs. If at the time of completion of a project, the funds received were more than the costs of the project, the Ministry could improve the
quality of the project by providing public facilities such as schools, health centres and parks. In addition, in cases where improvement in public facilities were not appropriate, the Ministry could return funds to applicants (as occurred in the cities of Hamadan and Arak).

The final price applicants paid for plots largely reflected the user-pays charge - the land cost component was only a minor component of the price (see Figure 5.10). Up until 1988, different prices for plots were not considered. The prepared plots were priced equally (per square metre only) and allocated using a lottery system. However, each plot had its own value due to location, accessibility to social services and other factors. Moreover, the system did not cater for low income purchasers. Because of the problems associated with a one price policy, in 1988, guidelines concerning pricing of plots were prepared and brought into operation. According to these guidelines, the price of developed plots was determined on the basis of six criteria including: the size of allotments, construction density, accessibility to roads, the number of sides, distance from social services and physical desirability of plots (Table 5.1). The outcomes of this change was revenue neutral but delivered substantially cheaper blocks. The major idea behind this was to improve the access of low-income families to land, even if they had poor accessibility and small size. Applicants who wished to get a large size allotment with a good location and good accessibility to roads and social services had to pay more.

| Table 5.1 Criteria for pricing allotments in land development projects in Iran |
|-----------------------------|-------------------------------------------------|-----------------|-----------------|-----------------------------|-----------------|
| Criteria                   | Size | Density | Accessibility to roads | Number of sides | Distance from social services | Physical desirability |
| Points                     | 8    | 4       | 3                         | 3               | 2                            | 5                |

5.3 Implementation effectiveness

From late 1985 to the first of February of 1993, over 38,768 hectares of public urban land was covered by this policy. There were 471 projects in total and dispersed in 223 cities across the whole country. While the policy covered only seven cities in the first year (1985), it increased to 50 in the following year and, by 1991, it reached 216 cities. In other words, with regard to the classification of Iranian cities almost all large and medium sized cities were covered. In addition, some cities contained more than one project. For example, in the first year the city of Kermanshah had four projects and in 1990, the cities of Hamadan, Tabriz, Shiraz, Mashhad and Arak had 17, 9, 6, 5, and 4 projects, respectively.

The total number and areas of projects varied over the years. The first year of the implementation of the policy had the lowest number and areas of projects, with only ten projects in seven cities. The number and areas of the projects started in the second year (1986) dramatically increased to 83 projects over 5,103 hectares land. Thereafter, there was a reduction to 62 projects over 4,900 hectares land in 1987 and to the lowest number and area of 47 projects over 3,454 hectares land in 1988. From 1989, the number increased to 69 and the area covered to 5,065 hectares land. The number and area changed again to 64 and 4,206 hectares in 1990 and reached a peak (83 projects with 7,357 hectares land) in 1991 (see Table 5.2). It can be suggested that this fluctuation in number and areas of projects was the result of legal and administrative processes associated with the new plan, particularly the requirement on the ULO to distribute only developed land. Therefore in the early years it offered most of its available developable lands to the DHA. Newly acquired land took time to be developed.

As mentioned earlier, the new urban land development policy had a broad range of goals. The initial objectives of the policy were:
to supply residential land together with needed infrastructure and public facilities;
proper urban development;
participation of people in the provision of infrastructure and public facilities;
reduction of government and municipalities' expenses on these services;
control over urban landscape;
housing provision; and
subsidies for low-income groups (MHUD, 1991a:5).

To respond to rapid urban expansion, two of these objectives were seen as the most
important - the elimination of public funds for the provision of infrastructure for new
residential areas, through the user-pays system and the provision of sufficient land.
Therefore, the remainder of this chapter will focus on the effectiveness of the policy
in relation to these two issues. A comprehensive evaluation will be undertaken in the
next three chapters through a case study, in which a broader range of objectives will
be analysed.

Cost-recovery effectiveness and findings of data analysis

The aim of this section is to evaluate the extent to which projects have succeeded in
recouping the cost of investments outlaid on infrastructure. The data on financial
aspects of the policy, particularly from the user-pays system point of view, was
collected through various departments including DHA, ULO, EHD, and the relevant
provincial offices. As discussed above, the process of infrastructure provision
consisted of a number of stages, such as contract arrangement and its
communication, consultant selection, design, approval and allocation of plots to
applicants. At the time of writing, the most recent data available included projects
started in 1991. Therefore, in this part of the study, projects which were undertaken
in the period from 1985 to 1991 are evaluated. Furthermore, the projects commenced
after 1991 were not sufficiently advanced to be analysed and for most projects their
data was not available. In this analysis, all projects implemented in the period 1985-
1991, were examined. In total 418 projects were examined, representing 31,741
hectares.
Variables in user pays system in new land development projects

Many factors influence user payments and many variables should be considered in any evaluation of the success or failure of the projects. The classification of projects may be based on several different variables, such as area, year commenced, urban characteristics and geographic dispersal. Indeed, all these variables are important in a rational analysis of the plan. It should be noted that the primary concern of this section of the study is to investigate the MHUD's user-pays policy for provision of infrastructure for new residential areas. Given this scenario the analysis of data is oriented towards the evaluation of projects' success within a planning framework and less towards the strict financial appraisal of the projects. The data is therefore not subjected to rigorous economic analysis but is used to provide indications of significant relationships between specified variables. A further important point is that project statistics on expenditures and user payments are based on the most recent data obtained from the MHUD and apply up until the first of February of 1993. Some projects were totally completed and some were in the earlier stages, based on their sizes and the year they were commenced. This analysis should reveal results about the implementation of the new policy in a given period (1985 to end of 1991).

There are three basic variables in the process of evaluation of the user-pays system in new land development projects, namely "expenditure", "user-payments" and "balance". These variables are analysed and presented through graphs and charts. The term "expenditure" in this context refers to the capital channelled by the government through the revolving funds. The details of expenditure include consultants' expenses and the cost of providing roads, water, electricity, drainage and sewerage systems. The term "user-payments" refers to the funds paid in by land applicants. The term "balance" refers to the recoupment of project costs from users, that is, the difference between user payments and expenditures. In addition, the term "ratio" is used to refer to user-payments as a proportion of expenditure. A ratio of one indicates that user-
payments were equal to expenditure. The terms “positive balance” and “negative balance” refer to projects in which user-payments exceed expenditures or in which expenditures exceed user payments, respectively. The overall results of projects and annual figures of the three terms are shown in Table 5.2.

Table 5.2 All urban land development projects in Iran, 1985-1991

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Area (ha)</th>
<th>Expenditure*</th>
<th>User payments*</th>
<th>Balance*</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>10</td>
<td>1656</td>
<td>12173</td>
<td>17599</td>
<td>5426</td>
<td>1.44</td>
</tr>
<tr>
<td>1986</td>
<td>83</td>
<td>5103</td>
<td>44497</td>
<td>45030</td>
<td>533</td>
<td>1.01</td>
</tr>
<tr>
<td>1987</td>
<td>62</td>
<td>4900</td>
<td>40295</td>
<td>34717</td>
<td>-5578</td>
<td>0.86</td>
</tr>
<tr>
<td>1988</td>
<td>47</td>
<td>3454</td>
<td>15385</td>
<td>17917</td>
<td>2532</td>
<td>1.16</td>
</tr>
<tr>
<td>1989</td>
<td>69</td>
<td>5065</td>
<td>8166</td>
<td>9048</td>
<td>882</td>
<td>1.10</td>
</tr>
<tr>
<td>1990</td>
<td>64</td>
<td>4206</td>
<td>3780</td>
<td>6483</td>
<td>2703</td>
<td>1.71</td>
</tr>
<tr>
<td>1991</td>
<td>83</td>
<td>7357</td>
<td>3006</td>
<td>3186</td>
<td>180</td>
<td>1.05</td>
</tr>
<tr>
<td>Total</td>
<td>418</td>
<td>31741</td>
<td>127303</td>
<td>133980</td>
<td>6678</td>
<td>1.05</td>
</tr>
</tbody>
</table>


Source: Author's calculation based on unpublished data from ULO, 1992c.

The term "balance" is an important term in the user-pays system of urban land development in Iran for three reasons. First, a large positive balance indicates that infrastructure can be provided on the basis of user payments so that public funds may be saved for basic development proposals at the national level. This was one of the aims of the new urban land development policy (Objective No 4 in Table 1.1). Secondly, the balance is important when applied to the large scale residential areas yet to be developed (Objective No 7 in Table 1.1). Thirdly, in the user-pays system, shanty towns could be prevented by ensuring that all development was adequately serviced. Obtaining enough funds at the right time enabled the MHUD to fully implement projects. In other words, the larger the advance payments, the greater was the ability for MHUD to provide adequate infrastructure (Objectives No 13 and 14 in Table 1.1).
When the user-pays system was initiated the effectiveness of the new system was unknown. This analysis attempts to assess the effectiveness of the new system. Assumptions and observations in relation to the impact of various factors provide the conceptual framework for the present evaluation. Factors such as city size, project scale, financial status of applicants, and physical conditions of the projects may affect the operation of the user-payments system. To examine the effectiveness of the user-pays system, the factors outlined above were analysed in a spreadsheet. Given that achieving a positive balance (i.e. user payments exceeded costs) was a key policy objective, it is important to evaluate the success of projects in meeting this objective and to analyse the cases where the objective was not met.

Ultimately all projects, when completed, will have a zero balance (see the Land Development Regulations in Appendix 2). However, a criterion for judging the effectiveness of the user-pays system is the extent to which projects can maintain a positive balance throughout the life of the project. This outcome will exert the least drain on the public purse. Some readers might take the view that older projects will necessarily perform better than newer ones because there has been greater opportunity to collect user payments. But older projects will also have incurred greater costs. The costs used to estimate the balance are not total project costs but rather the costs spent up to the end of 1991. Nevertheless, in an attempt to control for the age of project, data will be presented for both the total sample and for the projects which commenced in a particular year.

The projects were organised into several tables and ranked according to year of commencement, projects scales, city size and the ratio. Here, the most important variable was considered to be the balance or ratio column (the importance of which was discussed above). Through the consideration of the data in these two columns, significant correlations between variables became apparent. Because of problems with obtaining complete data sets for small projects, only projects greater than 10 hectares
were examined in the correlation analysis. In all, 155 projects were included in the analysis. The results of the analysis appear in Table 5.3. Spearman rank correlation analysis was utilised for two reasons:
- the presence of ordinal data; and
- it was considered that the use of an interval scale was unrealistic (Hammond and McCullagh, 1974).

The significance testing undertaken as part of the analysis examines whether the null hypothesis - that there is no relationship between the ratio measure and the selected variable - should be accepted or rejected. A two tailed t test was used. The significance levels shown in Table 5.3 indicate the level of confidence at which we can accept the alternative hypothesis that there is a significance correlation between the ratio and the selected variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Spearman Correlation</th>
<th>Significance level*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project scale</td>
<td>0.26</td>
<td>99%</td>
</tr>
<tr>
<td>City Size</td>
<td>0.28</td>
<td>99%</td>
</tr>
<tr>
<td>Financial status</td>
<td>-0.22</td>
<td>99%</td>
</tr>
<tr>
<td>Length</td>
<td>-0.14</td>
<td>90%</td>
</tr>
</tbody>
</table>

* Using a two tailed t test.

Project scale and user payments

The first variable examined was the size of projects. The projects were classified into four categories, namely:

1. Projects exceeding 200 hectares;
2. Those between 100-199 hectares;
3. Those between 50-99 hectares;
4. Projects under 50 hectares areas.
This categorisation generated approximately equal numbers of projects in each category and also achieved a good spread of categories across the different areas in Iran.

The first and one of the most significant findings was that most of the large scale projects have succeeded in recouping costs either for the initial projects or those started in recent years. Most of the medium scale projects (100-199 hectares) were borderline regarding success or failure in terms of user payments. However, most of the projects with areas between 50-99 hectares and less than 50 hectares (either old or new) have not succeeded in obtaining sufficient funds from the applicants (Figure 5.3). The correlation analysis summarised in Table 5.3 reports a significant correlation between project scale (classified into four categories) and the ratio at the 99% confidence level.

Figure 5.3 Expenditure, user-payment and balance by different sizes

![Bar chart showing expenditure, user-payment, and balance by different project sizes](chart.png)

Source: Author’s calculation based on unpublished data from ULO, 1992c.

Two important reasons can be suggested for these results. First, large scale projects provide substantial resources to respond to housing demand and may have significant effects on land utilisation and housing conditions in a given city. Therefore, these
projects were implemented under strict controls because their impact on housing conditions of cities are significant. Moreover, these projects were considered important in a political sense, since they were obvious demonstration projects for the new program. As a result, the various stages of these large projects including design and implementation were closely supervised by the MHUD. The second reason for these results is probably the presence of economies of scale. As the size of projects became larger, their relative costs could be reduced as materials to be used in a project could be mass produced. Evidence for this may be seen in the reduction of contractors' fees relative to increases in size. Therefore, it may be suggested that these projects had lower average costs than smaller projects.

City size and user payments

An analysis of the project data reveals that most projects having a significant positive balance were located in large cities such as Tehran, Mashhad, Tabriz, Shiraz, Kermanshah and Ahvaz. For example, the project with the highest positive balance amongst those commenced in 1986, a 115 hectare project in Tehran (the largest city and the capital of Iran). While the expenditure of this project was only 17.2 million Rials, spent largely on costs of design until 1991, user-payments was 169.2 million Rials (a positive ratio of 9.5) which shows a very high positive balance of user-payments. Further examples are all large scale projects in the city of Mashhad, the second largest city in the country (population 1,463,508 in 1991), which had positive balances. Amongst six projects commenced in 1986, the highest positive balance related to a 420 hectare project in Mashhad, while amongst 19 projects commenced in 1989, the only positive balance related to a 500 hectare project in this city. On the other hand, the project with the lowest negative balance in 1986 was a 147 hectare project in the small city of Shooshtar whose population was only 72,000 in 1991. As can be seen in Table 5.4, most projects implemented in large cities had positive
balances. The correlation analysis showed that there was a significant relationship between the ratio and the city size at the 99% confidence level.

Table 5.4 The effects of city size on user payments: major projects in large cities

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>Projects</th>
<th>Area (h)</th>
<th>Ratio</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tehran</td>
<td>6,042,584</td>
<td>Darabad</td>
<td>115</td>
<td>9.79</td>
<td>1986</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1463,508</td>
<td>Ghasemabad</td>
<td>420</td>
<td>1.87</td>
<td>1986</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1463,508</td>
<td>Bahr Abad</td>
<td>41</td>
<td>1.29</td>
<td>1986</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1463,508</td>
<td>Ebrahim Abad</td>
<td>33</td>
<td>1.21</td>
<td>1986</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1463,508</td>
<td>Noh Darreh</td>
<td>30</td>
<td>1.05</td>
<td>1987</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1463,508</td>
<td>Emamieh</td>
<td>500</td>
<td>3.06</td>
<td>1989</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Koyeh Laleh</td>
<td>25</td>
<td>1.79</td>
<td>1987</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Koyeh Emam</td>
<td>15</td>
<td>1.20</td>
<td>1987</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Baghmisheh-3</td>
<td>290</td>
<td>2.71</td>
<td>1987</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Zaafaranieh</td>
<td>95</td>
<td>0.84</td>
<td>1987</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Koy-e-Eram</td>
<td>183</td>
<td>0.78</td>
<td>1987</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Rezvanshahr</td>
<td>25</td>
<td>2.59</td>
<td>1989</td>
</tr>
<tr>
<td>Tabriz</td>
<td>971,482</td>
<td>Shahaboddin</td>
<td>150</td>
<td>35.49</td>
<td>1990</td>
</tr>
<tr>
<td>Shiraz</td>
<td>848,289</td>
<td>Bezin</td>
<td>475</td>
<td>1.38</td>
<td>1985</td>
</tr>
<tr>
<td>Shiraz</td>
<td>848,289</td>
<td>Mianroud</td>
<td>140</td>
<td>0.88</td>
<td>1986</td>
</tr>
<tr>
<td>Shiraz</td>
<td>848,289</td>
<td>Koshan</td>
<td>21</td>
<td>1.51</td>
<td>1986</td>
</tr>
<tr>
<td>Ahvaz</td>
<td>579,826</td>
<td>Golestan</td>
<td>581</td>
<td>1.37</td>
<td>1985</td>
</tr>
<tr>
<td>Ahvaz</td>
<td>579,826</td>
<td>Karoon</td>
<td>79</td>
<td>0.08</td>
<td>1987</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>560,514</td>
<td>Sorkheh lijeh</td>
<td>200</td>
<td>2.15</td>
<td>1985</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>560,514</td>
<td>Elahieh</td>
<td>50</td>
<td>0.59</td>
<td>1985</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>560,514</td>
<td>Boulvar-e Zan</td>
<td>20</td>
<td>0.33</td>
<td>1985</td>
</tr>
</tbody>
</table>

Source: Author's calculation based on unpublished data from ULO, 1992c.

These results may be related to the specific housing conditions and the size of cities. Like other large cities across the world, large Iranian cities have had housing and land problems. It can be suggested that the most important reason for a more successful rate of user-payments in large cities has been the difference between the governmental land price and the free-market housing price. As noted earlier, the price of governmental land and the costs of infrastructure items in comparison to free-market housing price was relatively very low. In 1992, the department of economic housing of the MHUD undertook research to find the free market land price in the large and some medium sized cities. Table 5.5 shows the result of the research in 18 cities in Iran in 1992. Therefore, it can be assumed that the applicants would have been very keen to secure their plots in large cities (title cannot be confirmed until all the instalments are made) and many would have paid their instalments in advance.
The conclusion that a user-pays system could be more successful in large cities has a number of ramifications. Better infrastructure may be provided in large cities. This can be seen as a factor in increasing the gap in living standards between large and small cities. In addition, this may lead to increasing the gap between less developed and more developed regions.

Table 5.5 Free market land price in 18 cities in 1992, Rials per square metre

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tehran</td>
<td>6620461</td>
<td>436,000</td>
<td>Rasht</td>
<td>359388</td>
<td>127,000</td>
</tr>
<tr>
<td>Esfahan</td>
<td>1159102</td>
<td>226,000</td>
<td>Ahvaz</td>
<td>752639</td>
<td>127,000</td>
</tr>
<tr>
<td>Tabriz</td>
<td>1102882</td>
<td>183,000</td>
<td>Hamadan</td>
<td>374541</td>
<td>123,000</td>
</tr>
<tr>
<td>Qazvin</td>
<td>279281</td>
<td>179,000</td>
<td>Yazd</td>
<td>282751</td>
<td>117,000</td>
</tr>
<tr>
<td>Mashhad</td>
<td>1820631</td>
<td>167,000</td>
<td>Orumiyeh</td>
<td>375431</td>
<td>116,000</td>
</tr>
<tr>
<td>Shiraz</td>
<td>963225</td>
<td>153,000</td>
<td>Kerman</td>
<td>332644</td>
<td>108,000</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>629578</td>
<td>144,000</td>
<td>Ardabil</td>
<td>322497</td>
<td>103,000</td>
</tr>
<tr>
<td>Qom</td>
<td>766987</td>
<td>139,000</td>
<td>Dezful</td>
<td>192759</td>
<td>85,000</td>
</tr>
<tr>
<td>Arak</td>
<td>354848</td>
<td>131,000</td>
<td>Zahedan</td>
<td>380925</td>
<td>70,000</td>
</tr>
</tbody>
</table>

Source: MHUD, 1992i:2.

Length of implementation and user payments

It can be suggested that the length of implementation has been one of the most important factors influencing costs, user-payments and effectiveness of the user-pays system. Therefore, for the purpose of this analysis, similar-size projects which commenced in the same year were grouped together. Over time, older projects have been the most successful, so most projects which commenced in the first years of implementation of the new plan have succeeded in obtaining funds from residents. The projects started in 1985 were almost near completion or entirely completed by 1992 and the balances of all three large scale projects (those larger than 200 hectares) were positive (Figures 5.4 and 5.5).
It could be suggested that the balances of projects began in 1985 were positive because of the time available to collect funds from applicants. The government was able to obtain funds from applicants over a long execution period. As noted earlier, one of the conditions of transfer of title of land to applicants was the full payment of infrastructure costs. By the time applicants had finished construction and required title, they had to have cleared their debts to the ULO. However, the situation is not that simple, since the costs used to calculate the balance only included costs incurred by the Government up to that date - not the complete budgeted cost. Given that the costs of land development are likely to be the most expensive in the early years of the development process (for example, expenditure per year per hectare for projects was substantially higher for the projects commenced in 1990 and 1991), there is no reason to suggest that it is more likely for older ongoing projects to have higher ratios. Rather what the ratios are measuring is the ability of the projects to generate positive cash flows and hence reduce the pressure on the MHUD to use their revolving funds to finance development.
While the average ratio of all projects was 1.05 (which itself was close to a borderline balance), the ratio of projects commenced in 1990 was the highest (1.71), and the ratio of the projects commenced in the first year (1985) was the second highest. The ratio for the projects started in 1986, 1988 and 1991 were close to average of all projects. However, the ratio of projects started in 1987 was 0.86, below the average. In other words, from the point of view of obtaining funds from applicants, the projects started in 1987 had failed (see Figure 5.5). The balances of most recent projects were positive from the early stages. Despite the fact that projects started in recent years were in the first stages of implementation, they succeeded in obtaining funds from the applicants in advance. The correlation analysis reveals a significant negative correlation between years and the ratio at the 90% confidence level. The smaller correlation coefficient is probably due to the 1987 projects running counter to the trend. The reasons for the poor performance of projects commenced in 1987 is discussed below.

Figure 5.5  Expenditures and user-payments of all Projects, 1985-1991 (million Rials)

Source: Author’s calculation based on unpublished data from ULO, 1992c.
Financial status and user payments

It was hypothesised that the financial resources of applicants may affect their ability to pay in advance and this should be considered in any assessment of the user-pays system. Households with less resources may have had difficulties in providing funds for infrastructure provision. Whilst no data were available on household income of applicants at the national level, the level of regional economic development can be used as a surrogate indicator (in the case study in Chapter Eight, household income data are available and this issue is analysed in more detail). Projects were categorised into three groupings consisting of: relatively developed, intermediate, and least developed provinces\(^1\). The most important finding was considered to be that the total balance in both developed and intermediate provinces was positive while it was negative in the least developed provinces (Table 5.6). The proportion of negative balance projects in these three categories was as follows. While in relatively developed provinces, only 33 projects out of 143 had negative balances (23 percent) and in intermediate provinces 54 projects out of 184 had negative balances (29 percent), in least developed provinces it was 30 out of 91 projects (33 percent). There was a significant negative correlation between the ratio and the regional development indicator (see Table 5.3) at the 99 per cent level.

<table>
<thead>
<tr>
<th>Provinces</th>
<th>Number of projects</th>
<th>Expenditure*</th>
<th>User-payments*</th>
<th>Balance*</th>
<th>Total Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relatively Developed</td>
<td>143</td>
<td>53755</td>
<td>56288</td>
<td>2532</td>
<td>14492</td>
</tr>
<tr>
<td>Intermediate</td>
<td>184</td>
<td>46781</td>
<td>53193</td>
<td>6412</td>
<td>12461</td>
</tr>
<tr>
<td>Least Developed</td>
<td>91</td>
<td>26766</td>
<td>24498</td>
<td>-2267</td>
<td>4788</td>
</tr>
<tr>
<td>Total</td>
<td>418</td>
<td>127302</td>
<td>133980</td>
<td>6677</td>
<td>31741</td>
</tr>
</tbody>
</table>

* Million Rials
Source: Author's calculation based on unpublished data from ULO, 1992c.

\(^1\) For categorisation of Iranian provinces based on regional disparity see Amirahmadi and Atash, 1987.
In order to explore the reasons for the failure of the projects of 1987, the projects with poor negative balances were analysed (see Table 5.7). The majority of those projects were located in the least developed and intermediate provinces.

Table 5.7 Major projects started in 1987 which had high negative balances

<table>
<thead>
<tr>
<th>City</th>
<th>Project</th>
<th>Expenditure</th>
<th>Ratio</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manjil</td>
<td>Manjil</td>
<td>35971</td>
<td>0.45</td>
<td>50</td>
</tr>
<tr>
<td>Ahvaz</td>
<td>Karoon</td>
<td>558317</td>
<td>0.08</td>
<td>79</td>
</tr>
<tr>
<td>Arsanjan</td>
<td>Saadat</td>
<td>563782</td>
<td>0.39</td>
<td>30</td>
</tr>
<tr>
<td>Ghoochan</td>
<td>Yaaghobabad</td>
<td>740778</td>
<td>0.37</td>
<td>63</td>
</tr>
<tr>
<td>Shirvan</td>
<td>Shomal Gharbi</td>
<td>1959134</td>
<td>0.32</td>
<td>150</td>
</tr>
<tr>
<td>Saravan</td>
<td>Saravan</td>
<td>1167899</td>
<td>0.33</td>
<td>60</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>Naiband</td>
<td>2134464</td>
<td>0.59</td>
<td>400</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>Honarestan</td>
<td>1087662</td>
<td>0.64</td>
<td>68</td>
</tr>
<tr>
<td>Toviserkan</td>
<td>Toviserkan</td>
<td>810648</td>
<td>0.45</td>
<td>80</td>
</tr>
<tr>
<td>Ilam</td>
<td>Tappeh Khargoshan</td>
<td>1290944</td>
<td>0.64</td>
<td>65</td>
</tr>
</tbody>
</table>

Source: Author's calculation based on unpublished data from ULO, 1992c.

The question here is whether in a user-pays system people who are unable to meet the full costs should or should not have access to infrastructure. Most equity considerations arise around the issue of who is to provide infrastructure, the private sector or users? In general, it may be suggested that the provision of basic infrastructure by the public sector, as is traditional in almost all countries, may be the most equitable. In this context, as with private provision, the concern is protecting the interest of low-income groups. Recovering the full costs of infrastructure provision through user-payments may be seen as creating problems for the poor. The differential pricing of land, outlined earlier in this chapter (Table 5.1), which developed lower prices for blocks, was one response to this issue.
Physical conditions and user payments

Another variable considered to impact on the operation of the user-pays system was the physical conditions of projects. The higher cost of some projects could be related to the physical condition of the land being developed. Examples of this are the significant effects of the negative balances of some projects, such as Shahinshahr and Astara, on the overall balance of a given year. Of three large scale projects started in 1989, two had negative balances. One of these projects (the 314 hectare project in the city of Shahinshahr) had one of the largest negative balances of all the large scale projects. While the total balance of 1989 large scale projects started in this year was 1.616 million Rials, the balance of the Shahinshahr project was -632,750 Rials. The expenditure for this project was 1,475.5 million Rials, whereas the applicants have paid 916.5 million Rials. This negative balance can be explained by the physical condition of the project, in which soil had to be replaced because of its insuitability for building construction and this increased the costs of project. Similar conditions also applied to the Astara project.

Table 5.8 The effects of physical conditions on user payments in some of the more expensive projects -projects with difficult physical conditions

<table>
<thead>
<tr>
<th>City</th>
<th>Projects</th>
<th>Area(h)</th>
<th>Ratio</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anzali</td>
<td>Koliver 1</td>
<td>90</td>
<td>0.09</td>
<td>1986</td>
</tr>
<tr>
<td>Arak</td>
<td>Gerdoo</td>
<td>70</td>
<td>0.81</td>
<td>1986</td>
</tr>
<tr>
<td>Tabriz</td>
<td>Zaafaranieh</td>
<td>95</td>
<td>0.84</td>
<td>1987</td>
</tr>
<tr>
<td>Orumiyeh</td>
<td>Orumiyeh</td>
<td>315</td>
<td>0.81</td>
<td>1987</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>Naiband</td>
<td>400</td>
<td>0.59</td>
<td>1987</td>
</tr>
<tr>
<td>Shahr-e-Kord</td>
<td>Darreh Mirabad</td>
<td>350</td>
<td>0.95</td>
<td>1987</td>
</tr>
<tr>
<td>Ilam</td>
<td>Tappeh Khargoshan</td>
<td>65</td>
<td>0.65</td>
<td>1987</td>
</tr>
<tr>
<td>Bandar Deilam</td>
<td>Bandar Deilam</td>
<td>65</td>
<td>0.16</td>
<td>1988</td>
</tr>
<tr>
<td>Shahinshahr</td>
<td>Shahinshahr</td>
<td>314</td>
<td>0.50</td>
<td>1989</td>
</tr>
<tr>
<td>Broojerd</td>
<td>Ghal-e Hatam</td>
<td>85</td>
<td>0.43</td>
<td>1989</td>
</tr>
</tbody>
</table>

Source: Author's calculation based on unpublished data from ULO, 1992c.
Other examples of negative balances were located in the cities of Tabriz, Bandar Abbas, Arak, Shahre-e-Kord, Anzali, Orumiyeh and Ilam. The ratios of these projects are shown in Table 5.8. As the table reveals, the expenditures were not recovered by user payments in either earlier or later projects, and difficult physical conditions may have been the reason for this. Three projects implemented in the cities of Ilam, Tabriz and Bandar Abbas were implemented on steep sites with consequently high costs.

**Inflation and user payments**

With expenditure and user-payments occurring over a number of years, inflation also affected the results of the analysis. Ideally, an evaluation of all projects should take into account the impact of inflation on both government expenditure and user payments. However, it was impossible to collect enough information to generate real expenditure and user-payment estimates for all projects. This would have required collecting detailed information on expenditure by year from almost all Iranian Local Authorities. Nevertheless, in order to examine the significance of this issue, three projects were selected and data was obtained to enable the generation of financial estimates in real amounts. A full examination of this issue is also made in Chapter Eight, using the most recent data collected in 1994 for all projects developed in the case study area.

For the three projects, nominal expenditures and user-payments were transferred into real statistics. The annual rate of inflation in Iran was 13.5 per cent per year between 1980 to 1990 (World Bank, 1992a:219). As can be seen in Table 5.9, the results changed slightly. This caused an increase in the ratio in the projects which balanced positively from the early years (in Tabriz and Shahre-e Kord). The ratio decreased with a positive balance in the last years (in Bandar Abbas).
Table 5.9 Impacts of inflation on ratio

<table>
<thead>
<tr>
<th>Projects</th>
<th>Area</th>
<th>Nominal ratio</th>
<th>Real ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baghmisheh, Tabriz</td>
<td>290</td>
<td>2.71</td>
<td>2.82</td>
</tr>
<tr>
<td>Darreh Mirabad, Shahr-e Kord</td>
<td>350</td>
<td>1.07</td>
<td>1.11</td>
</tr>
<tr>
<td>Honarestan, Bandar Abbas</td>
<td>68</td>
<td>0.98</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Source: Azizi, 1995a.

The highest ratio (of 2.82) was related to the 290-Hectare Project (Baghmisheh-3) in Tabriz. This is attributed to the size of the city, which is one of the largest cities in the country and the large scale of the project. The total balance of the second sample, the 350-Hectare Project of Darreh Mirabad in the city of Shahr-e Kord, is slightly positive. The scale of the project was large, though the city is small. The lowest balance was related to the 68-Hectare Project (Honarestan) in Bandar Abbas. This can be attributed to affordability, the city being located in a less developed region and its medium size.

Figure 5.6 Trends of real expenditures and user-payments in Baghmisheh-3 Project, 1987-1991
Cost-recovery effectiveness in medium-sized cities

As mentioned in the introductory chapter, the city of Arak has been selected to be examined in detail as a case study. It would be useful to evaluate the projects in medium size cities in order to compare the situation of Arak amongst other cities. According to most recent population data available, in 1991, 13 Iranian cities had
population between 250,000-500,000. These are considered to be medium sized cities in this evaluation. In total, 62 projects were implemented in these cities ranging from one project each in the cities of Karaj and Orumiyeh to 16 projects in the city of Hamadan. The largest total area of projects was related to the projects implemented in the city of Qazvin (1298 hectares, of which a project with 923 hectares commenced in 1991). The smallest total area of projects was in the city of Rasht (26 hectares). The reason for small amount of land developed in Rasht was related to land policies. This city is located in the north of the country, one of the most agriculturally productive regions, with little 'bayer' or 'mavat' land. Therefore, the acquisition of land by the ULO was not so effective. In this type of city, the land acquired by the ULO was dispersed and small sized land lots, which did not require planned development projects. Furthermore, housing was mostly provided by individuals on private lands.

Table 5.10  Results of user-pays system in cities with population of one quarter to half a million

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>Area(h)</th>
<th>Expenditure</th>
<th>User-payments</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ardabil</td>
<td>322497</td>
<td>496</td>
<td>790526</td>
<td>4717139</td>
<td>5.96</td>
</tr>
<tr>
<td>2 Kerman</td>
<td>332644</td>
<td>712</td>
<td>1552804</td>
<td>2655259</td>
<td>1.71</td>
</tr>
<tr>
<td>3 Rasht</td>
<td>359388</td>
<td>26</td>
<td>254162</td>
<td>407844</td>
<td>1.60</td>
</tr>
<tr>
<td>4 Arak</td>
<td>354848</td>
<td>303</td>
<td>1251069</td>
<td>1699073</td>
<td>1.36</td>
</tr>
<tr>
<td>5 Zahedan</td>
<td>380925</td>
<td>433</td>
<td>1740593</td>
<td>2340994</td>
<td>1.34</td>
</tr>
<tr>
<td>6 Qazvin</td>
<td>279281</td>
<td>1298</td>
<td>4126972</td>
<td>5053002</td>
<td>1.22</td>
</tr>
<tr>
<td>7 Zanjan</td>
<td>254932</td>
<td>244</td>
<td>1582190</td>
<td>1547791</td>
<td>0.98</td>
</tr>
<tr>
<td>8 Karaj</td>
<td>384326</td>
<td>115</td>
<td>1421902</td>
<td>1333600</td>
<td>0.94</td>
</tr>
<tr>
<td>9 Hamadan</td>
<td>374541</td>
<td>542</td>
<td>4853693</td>
<td>4155756</td>
<td>0.86</td>
</tr>
<tr>
<td>10 Orumiyeh</td>
<td>375431</td>
<td>315</td>
<td>4060437</td>
<td>3318234</td>
<td>0.82</td>
</tr>
<tr>
<td>11 Yazd</td>
<td>282751</td>
<td>453</td>
<td>3722464</td>
<td>3024613</td>
<td>0.81</td>
</tr>
<tr>
<td>12 Khorramabad</td>
<td>256115</td>
<td>229</td>
<td>1495041</td>
<td>1187105</td>
<td>0.79</td>
</tr>
<tr>
<td>13 Bandar Abbas</td>
<td>251450</td>
<td>496</td>
<td>4042377</td>
<td>2898884</td>
<td>0.72</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4209129</strong></td>
<td><strong>5662</strong></td>
<td><strong>30894230</strong></td>
<td><strong>34339355</strong></td>
<td><strong>1.11</strong></td>
</tr>
</tbody>
</table>

Source: Author's calculation based on unpublished data from ULO, 1992c.
The highest positive balance occurred in the projects implemented in the city of Ardabil (ratio of 5.96). A suggested explanation for this may be seen in the experience of previous successful projects. The lowest negative balance occurred in the city of Bandar Abbas (ratio of 0.72). This could be related to two issues previously discussed. Firstly, the city is located in a less developed province, and secondly, projects in the city experienced problems as a result of difficult physical conditions. The total area developed in the case study of this thesis, the city of Arak, was 303 hectares and the overall balance or total ratio was 1.36 up until 1992. This positive balance may be related to various factors such as regional context, population growth, land and housing conditions, and financial status of applicants which will be examined fully in Chapter Eight.

Land supply effectiveness

As mentioned above, in the period 1985 to 1991, the total area of land development projects was 31,741 hectares. According to the MHUD standards which average 25 dwellings per hectare (MHUD, 1989b:58), it may be estimated that approximately 793,000 dwellings were constructed in these projects, and 3,965,000 people accommodated. In 1986, the total number of applicants who were on the waiting list for obtaining land from the ULO was 333,000 of which 250,000 applicants were in cities which had new land development projects. However, despite a powerful land policy providing compulsory land acquisition by the ULO, there were many applicants on waiting lists. In 1988, there were still 500,000 applicants in cooperatives' waiting lists for land (MHUD, 1988a:49).

In the first Five Year Plan (1989-1993), the plan was to supply land for 1,582,000 dwellings. Out of this total, 34 per cent of development must have occurred on the ULO's land (Table 5.11). The total land distributed by the ULO during 1989 to the
middle of 1992 was 20,950 hectares, which was 6.6 per cent more than the land supply planned for the First Five Year Plan.

Table 5.11 Urban land demand during the First Five Year Plan, 1989-1993 (hectare)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>7560</td>
<td>7830</td>
<td>8100</td>
<td>8420</td>
<td>8710</td>
<td>40620</td>
</tr>
<tr>
<td>Public sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULO</td>
<td>5710</td>
<td>5920</td>
<td>6120</td>
<td>6360</td>
<td>6580</td>
<td>30690</td>
</tr>
<tr>
<td>New Cities</td>
<td>1850</td>
<td>1910</td>
<td>1980</td>
<td>2060</td>
<td>2130</td>
<td>9930</td>
</tr>
<tr>
<td>Private sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9250</td>
<td>9580</td>
<td>9900</td>
<td>10280</td>
<td>10640</td>
<td>49650</td>
</tr>
<tr>
<td>Total</td>
<td>16810</td>
<td>17410</td>
<td>18000</td>
<td>18700</td>
<td>19350</td>
<td>90270</td>
</tr>
</tbody>
</table>

Source: MHUD, 1992a:34.

Figure 5.9 Number of residential plots distributed by the ULO, 1982 to mid-1992

Source: Based on data from the ULO, 1992a.

As can be seen from Figure 5.9, one of the impacts of the new policy was a reduction of land to be distributed by the ULO in the initial years. The distribution of land by the ULO between 1982 and 1991 has fluctuated. In 1982 (the first year of the establishment of the ULDO's) 9,133 plots amounting to 230.8 hectares of land were distributed. The ULO distributed land for 89,283 households in 1984 (the year before the initiation of the new policy). However, then, the number of households receiving land from the ULO gradually decreased until 1988 in which there were only 43,441
households, the minimum level. In 1989, this distribution increased to 52,905 and in 1990 to 84,127. Thereafter, it increased and reached a historical level of 146,417 plots in 1991. In the first six months of 1992, also, it reached 93,706 households, the peak number since the commencement of post-revolutionary land policies.

The most important factor (perhaps the only factor) for the fluctuation of land supply was the effect of the implementation of the new policy of land development. Although a number of households received land in the period 1985 to 1988, they were related to the small projects for which development took relatively little time, or they were in developments which were too small to require a specific plan for infrastructure. However since 1988, when the development of many of the new projects was implemented (with basic infrastructure provided), and the ULO was allowed to distribute developed plots, the number of beneficiary households dramatically increased.

Figure 5.10  Real land price and infrastructure costs in Iran, Rials per square metre, 1982-1991

Source: Based on data from ULO, 1992d:9.
One of the issues associated with the user-pays system has been its delay in the provision of infrastructure, with consequent late land supply. The late provision of such services can slow down land release and lead to increased costs associated with delays. This is important in connection with the user-pays system, since increased costs associated with delays are ultimately passed on to consumers. Provision of construction materials, particularly those associated with the provision of water and electricity, was the major limitation in the policy affecting the timing of implementation. Figure 5.10 shows the impact of delays on increased costs and trends in land price and infrastructure costs. Over time, infrastructure costs have been increasing at a faster rate than the land component. Delays in provision of infrastructure may increase the costs.

Centralisation is one of the key issues concerning the provision of land. Its effects can be seen in various stages of the land development process including site selection, agreement, design, financing process and implementation. As noted earlier, there were no exemptions for project agreements, which all had to be approved in Tehran and communicated by the central MHUD to the provinces. For example, in the city of Hamadan, 12 projects had an area between one hectare and 10 hectares, while the total area of these projects was small, 60 hectares. In the early years, a central committee in Tehran was the only one allowed to select consultants for projects over 10 hectares. Although the provincial offices had the right to introduce their own consultants, the central committee was the final decision maker. It has been suggested (ULO, 1992d:14) that centralisation has delayed the implementation of the new projects, and consequently led to an increase in waiting lists for residential plots, particularly in the early years of the plan.

Another aspect of centralisation was related to the process of design. As mentioned earlier, in the early years, the layout of all projects exceeding 10 hectares had to be considered and approved by the Technical Housing Committee in Tehran. Because of
the large number of projects in this category, this probably led to delays in preparation and approval of plans and consequently a reduction in the available land supply. Further, a guideline was provided for consideration and approval of the detailed plans which some provinces could consider at the local level, using their existing professional staff. Others had to be considered in Tehran. The next stage of the process which had to be decided in the central MHUD was the selection of contractors. The final concern was related to the administration of the user-pays system of infrastructure provision. All funds collected had to be sent to Tehran and then later returned to the regions for continuation of the projects.

Another aspect of the new policy on land supply was the lack of planning. The implementation of the policy in different sized cities had different implications. In large cities, which usually needed a lot of land to cope with their housing problems, the small number of development projects could not cope with the need for land. Or in other words, in the initial years of the new plan, the distribution of projects was not executed on the basis of need. Indeed, in the early years of the implementation, the existence of public land was the most influential factor in deciding where to start projects, rather than an analysis of potential need. There was little correlation between population and the amount of land developed. In some provinces and cities with small populations, large amounts of land were developed.

Table 5.12 Residential land distribution pattern by ULO by City Size in Iran, 1989-mid. 1992 (percentage)

<table>
<thead>
<tr>
<th>City size</th>
<th>Tehran</th>
<th>Over 500,000</th>
<th>250,000-500,000</th>
<th>100,000-250,000</th>
<th>Less than 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in 1986 (m.)</td>
<td>6.04</td>
<td>5.96</td>
<td>1.84</td>
<td>3.75</td>
<td>8.85</td>
</tr>
<tr>
<td>% of total urban population</td>
<td>22.5</td>
<td>22.2</td>
<td>*</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>% of distributed Land</td>
<td>7</td>
<td>18.8</td>
<td>16.9</td>
<td>18.9</td>
<td>38.4</td>
</tr>
</tbody>
</table>

* No data available.

In the province of Chahar Mahal-Bakhtiari, for example, with a total urban population of 172,655 in 1986, 1,718 hectares of land was developed. Another example was the province of Kerman. While its total urban population in 1991 was 380,672, the total area of developed land was 2,947 hectares. By contrast, in provinces which had large populations, such as Tehran, East Azarbaijan, Fars, Khorasan and Esfahan, relatively small amounts of land were developed. One of the possible reasons for this distribution was an attempt to prevent the expansion of large cities and to encourage the growth of new cities. However, this aim was not explicitly stated in any planning document. Furthermore, as Table 5.12 shows, there was not a high correlation between number of plots allocated and city size (see also MHUD, 1988a:23,49).

5.4 Conclusion

The new urban land development policy had several primary aims including sustainable urban development as a whole, providing infrastructure for new residential areas, and supplying developed land to applicants. In the provision of infrastructure for new residential areas, one of the objectives was the elimination of public funds from provision of infrastructure in new areas. For this, the system of user-pays was used and until 1992, the MHUD had obtained enough funds to cover the costs of implementing the projects. If the MHUD obtained enough funds from applicants, it meant that basic infrastructure (water, roads, electricity, drainage and sewerage systems) could be provided, allowing urban households access to basic community needs. Consequently, the new plan could respond to the problems of rapid urban expansion and prevent the development of poorly serviced urban areas.

The analysis found that the cost-recovery process varied widely between each project. The system had different implications in different conditions. Through an empirical analysis of implemented projects, factors influencing the user-pays system
were recognised and various issues were raised. Factors such as city size, project scale, financial status of applicants, and physical conditions of the projects were amongst the most important factors.

In terms of the effectiveness of the land supply policies, the chapter raised some concerns about two policy elements. The first was the centralised nature of the land development process. It is considered that such a policy could lead to unnecessary delays. Secondly, despite the centralised nature of the development process there appears to have been a lack of overall planning in determining the project locations. The selection of projects, especially in the early years, seems to be driven more by the issues such as the availability of land, rather than by the likely need for developed land. These issues will be revisited in the conclusion.

This chapter has begun the process of evaluation of recent urban land development policy in Iran. Some further factors will be investigated in the next three chapters, using a case study approach. These factors will be considered by selecting some case studies in which different effects resulting from policies of user-payments versus public expenditure are investigated. The implications of the policy for land supply and environmental quality will also be examined.
Chapter Six

GROWTH AND CHANGE IN THE PROVINCIAL CITY OF ARAK

6.1 Introduction

As noted in previous chapters, the new urban land development policy had a broad range of objectives. The 14 objectives of the policy can be categorised into four major aims. The first aim was concerned with sufficient land supply to respond to immense population growth resulting in a high demand for land. The second was concerned with economic issues. It was declared that public funds could be directed towards major programs such as education and production. Therefore a user-pays system became a way in which infrastructure should be provided. The third category of objectives was related to institutional and organisational issues. The final objective was concerned with proper urban development through the prevention of squatter settlements. In this context the protection of agricultural land from conversion to urban areas was also considered as a major objective (objective no. 10 in Table 1.1).

An exploratory case study such as this should be able to address some issues raised by the research questions. The outcomes of the new policy may be sought by posing a question about the outcomes from this particular managerial reorganisation. However, it is essential to ask "why" and "how" the new program worked. With respect to "why", it should be asked why it was necessary to impose a new policy for land development in a city such as Arak? Regarding "how", it should be asked how this new plan was implemented? Therefore, as discussed in Chapter One, it is helpful to lean towards case study and field experiment. The case study consists of
three chapters. The first two will try to answer the question "why" and in the third, the questions "how" and "what" will be offered.

As a part of the overall methodology of this study, the city of Arak has been selected as a case study for assessing results of urban growth and government action to control it under the new residential land development policy. As noted in the introductory chapter, the choice of Arak reflects several criteria, including rapid population growth and the impact of industrialisation on urban expansion. The city of Arak has been one of the fastest growing cities in the country in the last two decades. Its economy is dominated by heavy industries which allows an examination of the effects of industrialisation on urban growth. Based on this framework, this chapter examines the historical, physical, economic and social factors that have influenced and continue to influence the city's growth and physical expansion. It covers four broad themes: the regional context, the impact of 1960s growth pole strategy on the region, physical setting of Arak, and residential areas.

6.2 Regional context

In order to understand the present urban development trends and residential environment of Arak, it is necessary to provide the context in which these developments came about. The city was originally established in 1808 as a military centre and, prior to 1937, was named Soltanabad (for historical background of the city see Sadigh, 1987:119-145, and Mohtat, 1989). The city is located in central Iran, some 280 kilometres south-west of Tehran at latitude 34, 5 North, longitude 49, 42 East and 1,708 metres above sea level (Figure 6.1). Its strategic location gives it excellent access to the other parts of the country. It functions as a node located between northern Iran, particularly Tehran, and the south-west, particularly Khuzestan Province, one of the most important regions exporting oil, industrial and agricultural products. Arak is also located along one of the most important rail-way lines of the country. Rail links Arak to major parts of the country, including the
Figure 6.1 Location of Arak in relation to administrative boundaries

Source: SCI, 1992c (new countries to the north amended and new province of Ardabil added).
cities of Ahvaz and Khorramshahr on the Persian Gulf, and Tehran and Caspian Sea in the north.

Administratively, the municipality of Arak, as the implementing body of urban development, is under the Markazi provincial government. It has to follow the policies of the provincial government which are expected to be in line with those of the central government. Up until 1977, Markazi Province included Tehran, the capital, and several major cities such as Karaj, Qazvin, Kashan and Qom. In 1977, however, the administrative situation changed. Tehran became a separate province and many major cities in the previous province were placed for administrative purposes in other provinces such as Zanjan and Esfahan. The new Markazi Province was formed and the city of Arak was selected as its capital.

Markazi Province now covers an area of 29,530 square kilometres and is located in the central-western part of Iran. It consists of eight Shahrestans (administrative counties) and 15 Bakhshs (districts) and contains 15 cities and 1,527 villages. In Arak's Shahrestan there are two cities (Arak and Komijan), two Bakhshs and 435 villages (Markazi PBO, 1992c:3; Zanjani and Mansouri, n.d.:7). Arak is the largest city in its Shahrestan, as well as the provincial capital. The population of the city was 56 per cent of its Shahrestan in 1986.

6.3 The 1960s Growth Pole Strategy and its impact on the region

During the 1960s, a new growth pole strategy was initiated by the government. Cities including Arak, Esfahan, Qazvin, Ahvaz and Tabriz were selected as industrial regions for the purpose of decentralisation from Tehran. Among the reasons for the selection of Arak as one of the growth poles was its geographical location in the central part of the country with its good rail links. Thus, Arak became a centre for heavy industries with the location of large factories such as Machine Sazi [machine production], Aluminium Sazi [Aluminium production] and
**Wagon Sazi** [Wagon production]. In the initial stage, the total area of the existing industrial zone was 390 hectares and, with the completion of this zone, will increase to 800 hectares (Figure 6.5) (Arseh, 1986b:49). This industrialisation had several impacts on the region, notably some demographic and economic effects. These are discussed below.

**Demographic impact**

The first impact of the growth pole strategy was on dramatic demographic changes in the region and Arak. In 1966 the population of the province (in its present area) was 656,843 and increased to 774,454 in 1976, and 1,082,109 in 1986. The annual population growth rate was 2.5 per cent between 1966-1986 and the urban population grew from 23.5 per cent in 1966 to 44 per cent in 1986. Population density increased from 22.24 persons per square kilometre in 1966 to 26.2 per cent in 1976 and 36.6 per cent in 1986 (Zanjani and Mansouri, n.d.:14-15). Of the 476,739 total population of *Arak's Shahrestan* in 1986, 271,640 was classified as urban and 205,099 was rural. The density of *Arak's Shahrestan* was 77.5 persons per square kilometre in 1986, the highest found in the province. The number of households of Arak Shahrestan was 56,331 in 1986 (Zanjani and Mansouri, n.d.:18-23; UARC, 1992).

The population of Arak increased dramatically after industrialisation. As noted above, until the early 1960s, Arak was a regional city servicing a limited area and, also it was primarily a link (nodal) city located on the rail route connecting the north and south of the country. Prior to industrialisation, its population growth was slow. In 1941 it was 51,365, increasing to 58,998 in 1956 and to 71,925 ten years later. This means a rate of annual population growth in these two periods of only 0.9 per cent and two per cent, respectively, while the national rate between 1956 and 1966 was 4.6 per cent. In other words, in both periods, the annual rate in Arak was lower than that of the country's natural rate of population growth (Eshragh, n.d., page 45).
However, during the first decade of the establishment of heavy industries in Arak, its population grew at five per cent annually. Therefore, for the first time in its history, the city became attractive to migrants (Arseh Consultants, 1986, Vol. 1, page 76). Between 1976 and 1986, the population increased from 116,832 to 265,342, with an annual 8.5 per cent growth rate, one of the highest rates in the country. This has been largely due to additions from the industrial zone as well as the impact of post revolutionary land policies which will be discussed later. Table 6.1 and Figure 6.2 indicate the extent of urban growth during the 1956 to 1986 period.

Table 6.1  Trend of population growth of Arak during four official census

<table>
<thead>
<tr>
<th>Year</th>
<th>1956</th>
<th>1966</th>
<th>1976</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>58,998</td>
<td>71,925</td>
<td>116,832</td>
<td>265,342</td>
</tr>
<tr>
<td>Annual growth rate</td>
<td>2 %</td>
<td>4.9 %</td>
<td>8.5 %</td>
<td></td>
</tr>
</tbody>
</table>


Figure 6.2  Trend of population growth in Arak during four official censuses, 1956-1986

Source: Based on various sources.
The advent of heavy industries into Arak had a great influence on rural-urban migration. Between 1966 and 1976, the rate of population growth of the region (Shahrestan) was only 2.3 per cent (close to the natural population rate). While the rate of growth in the city was 4.9 per cent in this period, it was 1.1 per cent for its rural areas. Consequently, Arak was transformed from a migrant exporting city to a migrant attracting city. During the period of industrialisation, a large number of local people, mostly from surrounding rural areas, were absorbed. Many of the immigrants who worked in the construction sector could not find industrial employment. They also did not wish to return to their rural homes (Arseh Consultants, 1986, Vol. 1, pp. 1-29 and 73).

Furthermore, the proportion of agricultural employment in the Arak region decreased from 64 per cent in the early 1960s to 50 per cent ten years later. The rate of literacy increased from 55.4 per cent in 1966 to 67 per cent in 1976 but this indicator decreased to 65.3 per cent in 1984 which could be as a result of rural-urban migration. Further evidence for this impact can be seen in housing types. The number of mud brick dwellings increased from 5,297 to 6,536 in the same period and reached 10,263 in 1983. This, may also be suggested as an indication of rural-urban migration (Arseh Consultants, 1986, Vol. 1, pp. 38 and 156).

Economic impact

Historically, the region of Arak was known as having sufficient water, soil, and gardens with large farms. Prior to the initiation of the 1960's industrial growth pole strategy, its economy was based on agriculture, handicrafts and carpet manufacturing activities. Since industrialisation, however, the industrial composition of its economic activities changed and expanded rapidly. Whilst the Markazi Province ranked fifth from the point of view of industrial activities, it was sixteenth in total economic activity amongst 24 provinces in 1986 (Kharat-
The most important criticism of the industrialisation in Arak has been that the types of industries had little or no relationship to its regional products nor its consumption. The new industrial zone in Arak was not established to improve the economy of the region. The evidence for this suggestion was that such industries were neither adapted to the natural resources of the region nor regional consumption requirements. For example, industrial capital in the region was not concerned with the processing of local raw materials. Instead, industrial location was mainly influenced by political decision making (Arseh Consultants, 1986, Vol. 1, pp. 17-21).

<table>
<thead>
<tr>
<th>City</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>11.6</td>
</tr>
<tr>
<td>Markazi Province</td>
<td>6.0</td>
</tr>
<tr>
<td>Yazd</td>
<td>5.5</td>
</tr>
<tr>
<td>Zanjan</td>
<td>7.7</td>
</tr>
<tr>
<td>Hamadan</td>
<td>8.1</td>
</tr>
<tr>
<td>Zahedan</td>
<td>9.6</td>
</tr>
<tr>
<td>Arak</td>
<td>9.7</td>
</tr>
<tr>
<td>Orumiyeh</td>
<td>10.2</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>11.0</td>
</tr>
<tr>
<td>Kerman</td>
<td>13.3</td>
</tr>
<tr>
<td>Rasht</td>
<td>16.5</td>
</tr>
<tr>
<td>Khorramabad</td>
<td>21.7</td>
</tr>
</tbody>
</table>

Source: Adopted from various tables, MHUD, 1992e.

Employment features may be considered as an important issue in the context of the economic impact of industrialisation. In 1986, the unemployment level in Arak was 9.7 per cent which was less than Iran and many other similar sized cities (Table 6.2). The reasons for these differences may be suggested as the impact of industrialisation. Arak is one the most industrialised cities in Iran and has more employment opportunities than many other cities. The share of various sectors in the economy of Arak fluctuated in the last three decades. Prior to industrialisation, the total proportion of industry and construction sectors was less than 40 per cent.
During and in the immediate post-industrialisation period, this proportion increased and reached over 45 per cent in 1966 (Tables 6.3 and 6.4). However, since then, the proportion of these sectors dramatically decreased and dropped to 31 per cent in 1976. Since the Revolution of 1979, this trend continued and the proportion of employment in the two sectors, industry and construction, decreased from 27.5 per cent to 24.3 per cent and from 17.8 per cent to 13.4 per cent, respectively.

Table 6.3 Employment in the city of Arak in the four censuses from 1956-1986 (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Services, trade and transportation</td>
<td>53.6</td>
<td>51.9</td>
<td>52.2</td>
<td>60.1</td>
</tr>
<tr>
<td>Industry* and construction</td>
<td>39.6</td>
<td>45.3</td>
<td>46.3</td>
<td>38.4</td>
</tr>
<tr>
<td>Agriculture</td>
<td>4.0</td>
<td>2.8</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>


Table 6.4 Number of employees by sector in Arak in 1976 and 1986

<table>
<thead>
<tr>
<th>Sectors</th>
<th>1976</th>
<th>%</th>
<th>1986</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>388</td>
<td>1.4</td>
<td>842</td>
<td>1.5</td>
</tr>
<tr>
<td>Mining</td>
<td>71</td>
<td>0.23</td>
<td>54</td>
<td>0.1</td>
</tr>
<tr>
<td>Industry</td>
<td>7355</td>
<td>27.5</td>
<td>13951</td>
<td>24.3</td>
</tr>
<tr>
<td>Construction</td>
<td>4766</td>
<td>17.8</td>
<td>7698</td>
<td>13.4</td>
</tr>
<tr>
<td>Water, Electricity and Gas</td>
<td>195</td>
<td>0.7</td>
<td>364</td>
<td>0.6</td>
</tr>
<tr>
<td>Sales</td>
<td>3802</td>
<td>14.2</td>
<td>6095</td>
<td>10.6</td>
</tr>
<tr>
<td>Communication</td>
<td>3003</td>
<td>11.2</td>
<td>4224</td>
<td>7.4</td>
</tr>
<tr>
<td>Financial and Insurance</td>
<td>513</td>
<td>1.9</td>
<td>925</td>
<td>1.6</td>
</tr>
<tr>
<td>Social activities</td>
<td>6345</td>
<td>23.7</td>
<td>20670</td>
<td>36.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>280</td>
<td>1.1</td>
<td>2564</td>
<td>4.5</td>
</tr>
<tr>
<td>Total</td>
<td>26718</td>
<td>100.0</td>
<td>57387</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Calculated from Hamoon Consultants (1990a: 32-33).

The most important reason for the decrease in the employment figures of industrial and construction sectors can be related to the type of industries in Arak. Most manufacturers in Arak were heavy industries which need more workers in the period of construction. At the time of completion of these heavy manufacturers, the majority of workers who were mainly unskilled became unemployed. Furthermore,
light industries which are usually attracted to support these heavy industries and create new employment were not established. Hence, workers became unemployed when construction was completed and could not be absorbed into heavy industries. In the petrochemical industry, for example, each job creates 20 sub jobs in light industries (Hamoon Consultants, 1990a:102 and Arseh Consultants, 1986, Vol. 2, pp. 4-6).

Administrative changes in the post-industrialisation period was another factor affecting the employment features in the city of Arak. The most important effect of this factor can be seen in the service sector. As noted previously, after industrialisation and to respond to the needs of industrialisation, the Markazi Province became a separate province with the capital of Arak. The selection of Arak as the capital of the province caused a rise in service sector employment. As Table 6.3 shows, in 1966, before industrialisation occurred, the service sector including services, trade and transportation comprised less than 52 per cent. However, this proportion increased dramatically to slightly over 60 per cent in 1986.

6.4 The physical development setting of Arak

Arak has faced several transitions in its physical development over time. As noted above, and throughout its history, the city was previously a small town serving as an administrative and dominant trading centre in its sub-region. The period of industrialisation, however, had a great impact on physical aspects of the city. Furthermore, since the 1979 Islamic revolution, the city, like other Iranian towns, has been confronted with physical expansion resulting from rapid rural-urban migration and post-revolutionary land policies (Figure 6.3). More recently, through the establishment of several heavy oil industries, Arak is likely to face with a second industrialisation period. Therefore, three distinct past periods of city development can be identified, all differing in their pace and the magnitude of their effects.
Source: Based on Arseh Consultants, 1986.

Figure 6.3 Physical expansion trends for Arak
Early development: prior to the 1960s

Many Iranian cities have valuable historical or religious backgrounds which have given them specific characteristics. These have, firstly, shaped their physical form; secondly, they have prevented degradation of the traditional urban fabrics. However, Arak is neither an historical nor religious city. Many other factors, such as the dominance of migrants, the lack of important urban heritage, and a lack of comprehensive planning, have created a city without much of an identity. A very limited area that might be seen as historical is located in the urban centre. In the 1930s, the traditional part of the city was a grid form totalling some 1,200 dwellings. The only important historical and heritage part of the city was the Bazaar (trading line), plus some individual administrative and cultural buildings (Eshragh, n.d., page 21).

Table 6.5  1966 land use pattern and 1991 proposals

<table>
<thead>
<tr>
<th>Land Use</th>
<th>In existence in 1966</th>
<th>Proposed for 1991</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (ha)</td>
<td>Per capita (Sq.m)</td>
</tr>
<tr>
<td>Residential</td>
<td>235.0</td>
<td>32.6</td>
</tr>
<tr>
<td>Roads</td>
<td>56.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Parks</td>
<td>7.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Education</td>
<td>12.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Light industries</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Commercial</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Administrative</td>
<td>11.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Health</td>
<td>3.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Religious</td>
<td>10.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Recreational</td>
<td>1.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>337.1</td>
<td>46.8</td>
</tr>
</tbody>
</table>


As can be seen in Table 6.5, major changes were predicted in the land use pattern. Although the per capita area of most land uses increased, the major increase was in road space. The per capita area of roads increased from 7.8 square metres to 17.5 square metres. This indicates that the master plan predicated a major increase in automobile use in the city, resulting from the introduction of heavy industries and
economic transition. In 1966, the total area of the city, including the industrial zone, was predicted to reach 3,684 hectares by 1991 (Eshragh, n.d., page 50).

The land use pattern of the city indicates that it was a small traditional town before the start of the 1960s growth pole strategy. The city was mainly comprised of residential uses, which formed about 70 per cent of the city's total area (Figure 6.4). The percentage covered by roads also reveals that the city was not much influenced by the automobile. While the percentage of roads is between 20-30 per cent in recent land use patterns of Iranian cities, usually considered in master plans, it was only less than eight per cent in Arak in 1966. Further, the percentage of many other uses, such as education and health, are a small portion of the city's total area. The total area of the city, including open spaces and vacant land, was only 454 hectares in 1966, of which 70 hectares (15.5 per cent) was vacant land (Eshragh, n.d., p. 20).

In addition, while in most Iranian cities, the per capita area averaged about 100 square metres of land, it was less than 50 square metres in Arak (Table 6.5). This implies that the city confronted a serious shortage of per capita land in all uses.

Figure 6.4 Land use in existence in 1966 (%)

```
<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>69.73%</td>
</tr>
<tr>
<td>Roads</td>
<td>16.61%</td>
</tr>
<tr>
<td>Services and others</td>
<td>13.66%</td>
</tr>
</tbody>
</table>
```

Source: Based on Table 6.5.
The period of industrialisation

The most prominent features of the industrial period were the effects on the city's structure. As a result of the growth pole strategy, Arak experienced explosive and phenomenal growth affecting every aspect of the city's structure (Markazi PBO, 1992b). Dramatic changes in its traditional structure took place and the city grew from a small town into a medium sized city with completely changed functions. The location of the industrial zone was selected at the fringe and formed a contiguous expansion (Figure 6.5). Following the designation of Arak as a growth centre, the economic transition involved a significant increase in the construction of urban infrastructure and buildings, both of residential and non-residential kinds. Arak's urban structure began to take on a new shape and it acquired new elements, forms and functions.

As noted previously, a master plan scheme was introduced for Iranian cities in the 1960s. Arak was one of the first cities that experienced master planning. The preparation of a first master plan for Arak was assigned to the Housing Organisation (a government institute) in 1966 and the plan (layout) was approved by the High Council of Planning in 1968. The city's traditional core was designated as the central business district. The plan zoned land for residential use in the north and north-east where most land was in agricultural use. This development was intended to accommodate the rapidly increasing population. Figure A.3.1 in Appendix 3 shows the layout of this master plan.

However, Arak did not mainly develop on the basis of its first master plan for several reasons. The first was the delay in the implementation of the plan. While the first master plan was approved in 1968, its official implementation was delayed until 1973 when the final draft was approved by the High Council of Planning and communicated to the municipal council for implementation (Eshragh, n.d., p.3).
Figure 6.5 Location of the Industrial Zone and Industrial Town in Arak

Source: Based on Arsch Consultants, 1986.
The second reason for not implementing the master plan was the lack of a detailed plan. At the beginning of the preparation of master plan, the preparation of detailed plans was not considered. It was not until eight years after the preparation of the Arak master plan that its detailed plan was launched. In late 1976, the preparation of a detailed plan was committed to the Group-9 Consultants (Group-9 Consultants, 1978:3). However, it was noted in the detailed plan that the revision of the existing master plan was necessary. The reason for this, as reported, was to prevent the destruction of the traditional area of the city while the widening of streets was considered in the initial master plan (see, Arseh Consultants, 1986, Vol. 1, page 1).

The third reason was the lack of up-to-date data. The aerial photo used for the master plan related to eight years before the preparation of plan. During this period many changes had occurred in the city's structure. The fourth reason was related to inaccurate population forecasts. In research undertaken by the Social Research Institute in 1966, the population of Arak was projected at 148,000 for 1991 and on the basis of this population forecast, the master plan was prepared. However, in 1968, the government advised the consultant to consider a maximum population figure of 300,000, assuming a six per cent annual population growth rate up to 1991 (Eshragh, n.d., page 46).

Following rapid population growth, particularly due to rural-urban migration, many new informal residential areas were developed (Figure 6.6). The pressure for conversion of gardens and green spaces to residential uses was accelerated. While owners could not convert productive gardens to residential areas, they neglected gardens in order to sell them as residential lots. Further, on the southern and western slopes, illegal dwellings were constructed. These dwellings were faced with water shortages and other service deficiencies. The reason for these deficiencies was that responsible service agencies served only residents within the legal city boundaries (Group-9 Consultants, 1978:14). Although some residential sites were developed for settlement of industrial workers, such as Industrial Town, Ghanat and Oil Company,
LEGEND:

Unplanned expansion

Source: Author.

Figure 6.6 Unplanned expansion of Arak
Plate 6.1  Football area (Autumn season, 1994)
A view of unplanned expansion, Arak. The city stretches over mountains.
Source: Author.

Plate 6.2 The unplanned Football area (Winter season, 1993)
An example of urban expansion pressure in Arak. The city stretches to the public right of way on the main country road.
Source: Author.
they were developed individually without considering the city structure as a whole. The apartments in Industrial Town were allocated to industrial staff and skilled workers, thus unskilled labour who were the majority of employees, could not obtain them. This can be seen as another factor giving rise to squatter settlements.

The city grew far beyond what was originally envisioned in the first master plan. To the west, the city periphery expanded beyond the main ring road limits. To the south, the city stretched over vast areas that were considered to be uninhabitable only a few years before. To the north (west), the city periphery expanded beyond the legal boundaries. A pattern of squatter settlement occurred and suburbs such as Football, Mostouphy, Bagh-e Khalaj and Roodaki were formed as informal settlements, although some of these areas had developed before the revolution (Figure 6.6 and Plates 6.1 and 6.2). The total unplanned area was 184 hectares in 1986, covering a population of 47,000 with 250 persons per hectare gross density (Arseh Consultants, 1987:4). This process lasted until 1983 when a new master plan was assigned to be prepared.

Since the Islamic Revolution of 1979

The third turning point in the city's expansion came after the revolution of 1979. Between 1976 and 1983, in seven years, the population of the city doubled. This period can be divided into two phases. As discussed in Chapter Three, the immediate years after the revolution were chaotic. In Arak, too, administrative control as well as urban development control broke down. People built informal and irregular housing on the fringe. Many gardens and open spaces were also converted to residential areas. Between 1977 to 1984, over 400 out of 644 hectares of gardens changed to residential uses (Arseh Consultants, 1986, Vol. 1, page 144).

The second phase was a period of formal post-revolutionary land subdivision leading to inefficient expansion of the city. As noted earlier, the ULO was given
priority in land acquisition according to the type of land. First, it could possess the 'mavat' land, then, 'bayer' and, finally, farms. Because Arak was amongst the 32 cities discussed in Chapter Three, the ULO could possess farms and convert them to residential areas. The ULO acquired lands and distributed them over time, causing physical fragmentation of the city and a leap-frog pattern of development. In 1986, there were 41 cities in Iran with a population of over 100,000. The population growth of Arak increased at a rate of 8.5 per cent per annum between 1976 and 1986. Apart from the Tehran metropolitan area, this growth rate was the third fastest among the 41 cities and ranked after Zahedan with 11.6 per cent and Bandar Abbas with 8.6 per cent per annum (Zanjani and Rahmani, 1989:176-179).

The implications of this rapid growth in population and area are seen in a number of ways. One of the immediate impacts of rapid population growth was the decreasing size of residential lots. Some lots of between 40 and 50 square metres were allocated and developed. Another impact of this period were the decrease in open and green space. While Arak basically confronted the problem of a lack of green space in the past, the per capita space dropped to less than 0.2 square metres in 1983.

These conditions required formulation of a new plan. The previous chaotic urban growth of the city accentuated the need for more controlled and guided city planning. Therefore, a new consultant for such planned expansion, Arseh Consultants, was employed in 1983 to lay the groundwork and the new master plan was approved in 19851. The land use pattern of this plan is shown in Table 6.6 and

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1 The appointment of consultants for master plans in Iran was undertaken through the Plan and Budget Organisation (PBO) in Tehran in cooperation with the MHUD. The registration of consultants takes place in a specific office in the PBO through the criteria including qualified members and their specialisations. Planning consultants are among those that consist of qualified planners, architects and related fields. Most planning consultants that are eligible for master planning, as well as other projects such as land development plans, are in Tehran. The Arseh Consultants, too, is a qualified and registered private firm in Tehran. Further, they were appointed as consultants for two major recent land development projects including the "Gerdoo" and the "102-Hectare" projects which will be examined in Chapter Nine.
its layout is shown in Figure A.3.2 in Appendix 3. According to the new plan, the city's growth would continue to adopt a contiguous expansion mainly to the north. This form, as will be discussed in the next chapter, was mainly influenced by natural features in the south and west, as well as the industrial zone in the east. According to the new master plan, the total area of the city will have increased from 2,109 hectares in 1985 to 3,870 hectares in 1995 (Table 6.6 and Figure 6.8). In 1984, the population density of the whole city was 138 persons per hectare and, with the exemption of two major functions (industrial and rail way), it was 190 persons per hectare.

Table 6.6  Land Use Pattern in existence in 1985 and proposed for 1995

<table>
<thead>
<tr>
<th>Land Use</th>
<th>In existence in 1985</th>
<th>Proposed for 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per capita (Sq. m)</td>
<td>Area (ha) %</td>
</tr>
<tr>
<td>Residential</td>
<td>40.0</td>
<td>1000.2 47.4</td>
</tr>
<tr>
<td>Roads</td>
<td>17.8</td>
<td>21.2 22.7</td>
</tr>
<tr>
<td>Industrial</td>
<td>1.5</td>
<td>1.8 26.4</td>
</tr>
<tr>
<td>Education</td>
<td>1.4</td>
<td>1.6 2.5</td>
</tr>
<tr>
<td>Commercial</td>
<td>1.1</td>
<td>1.3 1.7</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1.0</td>
<td>1.2 1.7</td>
</tr>
<tr>
<td>Administrative and police</td>
<td>0.7</td>
<td>0.8 0.9</td>
</tr>
<tr>
<td>Sports</td>
<td>0.6</td>
<td>0.7 1.3</td>
</tr>
<tr>
<td>Religious and cultural</td>
<td>0.5</td>
<td>0.6 0.6</td>
</tr>
<tr>
<td>Health</td>
<td>0.5</td>
<td>0.5 0.8</td>
</tr>
<tr>
<td>Parks</td>
<td>0.2</td>
<td>0.2 0.2</td>
</tr>
<tr>
<td>Tourism</td>
<td>0.2</td>
<td>0.2 0.2</td>
</tr>
<tr>
<td>Sub total</td>
<td>65.5</td>
<td>1637.7 77.7</td>
</tr>
<tr>
<td>Vacant land</td>
<td>109.4</td>
<td>5.2 0.0</td>
</tr>
<tr>
<td>Farms</td>
<td>102.1</td>
<td>4.8 2.6</td>
</tr>
<tr>
<td>Open spaces</td>
<td>2.6</td>
<td>0.1 2.6</td>
</tr>
<tr>
<td>Gardens</td>
<td>257.7</td>
<td>12.2 6.0</td>
</tr>
<tr>
<td>Total</td>
<td>2109.6</td>
<td>100.0</td>
</tr>
</tbody>
</table>


As noted previously, there is no a national or regional plan in Iran, which has given rise to many problems during planning for cities. As such, when the consultants were preparing the latest master plan for Arak, a new industrial zone in the city's west was established. Based on the requirements of the industrial zone, the MHUD began to plan a new town in the adjacent area. The establishment of several new
post-revolutionary heavy industries in the Arak region implies that the problems of the city are likely to be aggravated in the future. For example, it was estimated that the oil refinery would attract up to 10,000 construction workers (plus their families, adding up to about 50,000 population), mostly unskilled and originating from the surrounding rural area. After finishing the construction stage they were likely to stay in the city of Arak. The total number of workers at the refinery during the operation phase will be between 1200 and 1500 (Arseh Consultants, 1986, Vol. 2, page 6) and it is predictable that the implementation of new industries will affect various conditions in the city. Building construction and economic activities will be accelerated in both the public and private sectors. These problems partially arise as a result of the lack of regional planning and appropriate regional development.

6.5 Residential areas

Since this study is concerned with new residential areas as the major focus, understanding the past and current circumstances of existing residential areas in Arak is important. Whilst Chapter Nine examines the contemporary responses to land development pressure in Arak through the examination of recent residential land development projects, it is essential to consider the existing residential conditions in built-up areas. Therefore, in this section, a review of these conditions is undertaken.

As will be discussed in Chapter Nine, decision-making about density has been a crucial stage in the process of planning for new projects. In order to consider the situation of new land development projects, this section examines the conditions of density as a major factor influencing various economic and environmental aspects of the built-up areas. The presence of higher gross population density as well as net residential density are two indications of physical pressure in Arak. Both densities tended to increase in past years which may give rise to many problems. While the existing gross population density in 1966 was 158 people per hectare, in the initial
master plan it was projected to decrease to 117 by 1991. However, gross population density actually increased to 190 persons per hectare by 1983 and 195 persons per hectare by 1986 (Eshragh, n.d., p.65; Hamoon Consultants, 1990a:121; and Arseh Consultants, 1986, Vol. 2, page 44).

Although net residential density varies in different areas of the city, it has been above the densities considered appropriate in master plans in Iran. In 1986, for example, the net residential density in the whole city was 294 persons per hectare. This varied in different areas so that in some areas it reached 400 persons per hectare. The tendency of density increase can be also measured in planned areas. In 1983, the lowest population density was in the Oil Company neighbourhood as a planned area developed after industrialisation with a density of 13 people per hectare. However, it dramatically increased in the most recent pre-revolutionary planned areas. The highest density was in the Industrial Town, the most significant pre-revolutionary planned area (see Figure 6.5), with a 139 people per hectare density. With the completion of this town, it has been projected to further increase (Arseh Consultants, 1987:5). Furthermore, another indication of inappropriate design in residential areas can be seen in the amount of open space. As previously noted, the city of Arak has one of the lowest per capita of open and green spaces amongst all Iranian cities. For this, in the new master plan of 1985 the share of residential areas of the city was projected to decrease from 47.4 per cent in 1985 to 42.6 per cent in 1995 (Figure 6.7 and 6.8). The reasons for this were the release of land for public facilities as well as the decreasing density in the built-up areas.
Figure 6.7  Land use in existence in 1985 without Industrial Zone

Source: Based on Table 6.6.

Figure 6.8  Land use proposed for 1995 (without major industrial zone)

Source: Based on Table 6.6.
The last indication of higher population density in residential areas in Arak can be seen in its share (proportion) of the whole built-up area. This proportion is important since it illustrates the conditions of the overall living environment by indicating the extent of open and green spaces and sufficiency of existing spaces for public facilities such as schools, health centres and sport areas. While in 1966 the share of the residential area as of the whole built-up area was 52 per cent, it increased to 62 per cent in 1977. This was mainly due to the needs of demand resulting from industrialisation. However this figure changed in 1983 and decreased to 56.4 per cent (Table 6.7). The reason for this decrease can be suggested to be the above mentioned density increase together with the limitation of land supply and expansion constraints of the city as will be discussed in Chapter Seven.

Table 6.7 Trend of changes in residential area in Arak in selected years*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential area (ha)</td>
<td>235</td>
<td>516</td>
<td>998</td>
<td>1,189</td>
</tr>
<tr>
<td>% as of city area</td>
<td>52</td>
<td>62</td>
<td>56.4</td>
<td>32.3</td>
</tr>
<tr>
<td>Per capita (Sq. m.)</td>
<td>32.6</td>
<td>43</td>
<td>40.0</td>
<td>39.6</td>
</tr>
<tr>
<td>City population</td>
<td>72,000</td>
<td>120,000</td>
<td>240,000</td>
<td>300,000</td>
</tr>
</tbody>
</table>

* Data available in the calculation of this table are for different years than the data available in Figures 6.7 and 6.8.

** Proposed in the master plan of 1986.

Source: Adopted from Hamoon Consultants, 1990a:123

Through the analysis of the density increase in Arak, several issues can be identified. The first issue is ineffective planning. The master plan had failed to achieve its goals regarding density. In the current master plan of 1985, it has been projected that density should increase to 116 persons per hectare. However, the previous experience, as discussed above, indicates that there should not be an optimistic anticipation to reach this goal and even it is likely to be aggravated. Secondly, the trend of density increase indicates a higher housing and land demand which will be discussed in the next chapter. Thirdly, negative aspects of this density
increase on the environment and infrastructure costs can be a critical issue in relation to overall issue of urban development as will be discussed in Chapter Eight.

The last issue concerning residential areas is residential segregation. It can be noted that in Arak, residential segregation is not considerable and people with various incomes have settled all over the city. This is in contrast to cities such as Tehran where the north is mainly rich and the south is poor. The only area in Arak which might be seen as a rich area is the traditional area of Malek located in the city's centre. However, following industrialisation, residential segregation was likely to be a considerable issue. Massive numbers of rural-urban migrants tended to concentrate mainly in the fringe where land was cheap. Therefore, fringe areas tended to be characterised by squatter settlements and slum areas, as examples of these areas were shown previously (Plates 6.1 and 6.2). The post revolutionary land policies, however, had a strong role in preventing ever spreading disparities. As noted previously, the income of land applicants was not considered an important criterion for land allocation. On the other hand, most land owned by the ULO was located at the fringe. Therefore, the distribution of these lands changed the pattern of segregation and a mixed settlement began to occur again.

6.6 Conclusion

This chapter examined growth and change in Arak from its earlier emergence to the present situation. The key factors influencing the city's physical expansion, including administrative changes, industrialisation and the revolution were investigated. The impact of the industrial growth pole strategy on both the demography and economy of the region as well as the city structure was examined. It was shown how industrialisation affected the physical conditions of the city as it was the most important factor causing rapid urban expansion mainly due to massive rural-urban migration. Fundamental changes occurred in the demographic and economic features of the region and the city. Arak evolved from a small town
serving its limited rural area to a medium sized city in a short period of time with a dramatic population growth rate.

With a view to the main focus of this study, the conditions of residential areas in the city were interpreted. It was indicated that the overall conditions of these areas tended to be worse than before industrialisation. The overall density in built up areas as well as in residential areas tended to increase in the past, either in unplanned or planned areas. It can be suggested that higher population density housing is appropriate because of land limitation and the costs of infrastructure provision. However, residential areas in Arak have had high densities while the city has been suffering from lack of open and green spaces, public facilities and infrastructure deficiency. Considering the above mentioned physical expansion pressure in Arak, the next chapter will proceed to examine the key problems of land development in the city including housing needs, the physical constraints of land supply, and infrastructure inadequacy.
Chapter Seven

KEY PROBLEMS OF LAND DEVELOPMENT IN ARAK
Housing, Land and Infrastructure

7.1 Introduction

The previous chapter examined the historical, economic and physical characteristics of Arak. The impact of industrialisation under the 1960s growth pole strategy as well as the revolution on the various aspects of the city, particularly physical expansion, were investigated. These issues were identified as major factors influencing the rapid expansion of the city. The last section established the characteristics of the city's existing residential areas and these will be discussed in relationship to the most recent land development projects in the next chapter.

This chapter specifies the problems of land development in Arak. It covers three key issues: housing, land and infrastructure. The first section considers key aspects of housing issues which are related to urban expansion and urban land development policy, including housing stock, production, demand, type and quality. In the second section, the physical constraints of land supply are discussed, highlighting the importance of land issues in Arak. The final section examines the key infrastructure elements including roads, water, sewerage and drainage systems and their inadequacies.

7.2 Housing

In order to understand the necessity for creating a better residential environment in Arak, it is necessary to consider the present housing conditions. On the one hand, as discussed in Chapter Two, housing is a basic human need and the most fundamental issue in urban land development, but on the other hand, to respond to population
growth and elimination of housing shortages, massive housing production causes urban expansion to occur with consequent problems. The housing issue covers a broad range of concerns, such as land, financing, affordability, and materials. However, those factors which are related to land development and are key issues affecting urban expansion are discussed here. There are several housing indicators in Arak which are concerned with overall land development issues. Three broader areas including first, housing stock and production, second, demand, and third, housing type and quality are examined here.

**Housing stock and production**

Trends in Arak's housing conditions, like its physical development, can be divided into three phases including pre-1960's industrialisation, post industrialisation and since the revolution. The conditions in the period before industrialisation in 1960s are not as important as the two other periods because of the city size and its function as discussed previously. Furthermore, there are little data available regarding housing conditions in that period. Available data refer to the number of dwellings and some primary indicators such as housing shortages and the number of families\(^1\) per dwelling (MDH, 1972). The most important issue is housing shortage. In 1966, dwellings numbered 8,758 and families totalled 14,048. In other words, there were 1.6 families per dwelling. While this figure indicates an absolute housing shortage, surprisingly, in the initial master plan report prepared by Sazeman-e Maskan in 1968, it was noted that housing conditions in Arak were acceptable: "with regards to the number of families per dwelling which was 1.6, it can be suggested that housing conditions in the city of Arak are not in crisis" (Eshragh, n.d., pp. 23-24). Although the housing production increased in the two next periods, as will be shown, the

\(^1\) The reason for using the term family instead of household was explained in Chapter Five.
housing shortage has never been solved. The quality of housing in terms of age and structure was also of concern. For example, according to the census of 1956, over 85 per cent of dwellings were made from sun-dried clay or mud (Mohtat, 1989:127).

The second phase concerns the industrialisation period of Arak. The trend of traditional housing production continued as well as the initiation of specific housing programs for new industries. Since industrialisation, new housing schemes were introduced in which the most significant project was the development of the residential 'Industrial Town' comprising an area of 120 hectares (Figure 6.5 in Chapter Six). While the total number of dwellings in Arak was 8,758 in 1966, proposed dwellings in this town numbered 3,800 units, of which 2,000 units were completed by 1978. By 1978, some 32 per cent of industrial workers lived in Industrial Town. However, the development of this town had little effect on the elimination of the housing shortage in Arak and it was available only to industrial workers and their families. In 1977, the number of dwellings in Arak was 19,000 and the number of families had now increased to 24,300. In other words, 1.3 families now lived in each dwelling, compared to 1.6 families in 1966 (Group-9 Consultants, 1978:15). Despite specific housing programs for industries, a housing shortage continued.

The third phase concerns the post revolution period from 1979 in which the production of housing, like the city's growth and expansion, has been immense (Table 7.1). Since the revolution, housing production in Arak increased rapidly, as it did in all the urban areas discussed in Chapter Three. Between 1976 and 1986, about 3,200 dwellings were constructed each year. The housing stock increased from 18,294 in 1976 to 50,206 dwellings in 1986, representing over 10 per cent annual increase. As Table 7.1 reveals, while the total number of housing permits was 727 in 1978, the year of the revolution, it reached 2,281 in 1983, the year before the initiation of the new urban land development policy. In 1989, approximately 56 per cent of all dwellings had been built since the revolution of 1979.
Mass housing production between 1976 and 1986 resulted in major changes to housing in Arak and affected the key housing indicators including: the housing stock, the number of persons per dwelling and per room, the number of families per dwelling and the level of home ownership. The speed of housing production was greater than that of household formation and population increase. The total number of dwellings constructed over ten years was 32,000, while the increase in the number of families was 31,000. Further, while the population and number of families increased by 127.1 and 124.1 per cent between 1976 and 1986, the number of dwellings increased by 168.1 per cent (Figure 7.1). Annual population growth in family numbers was 8.4 percent, in contrast with an annual dwellings increase of 10.62 per cent (Hamoon Consultants, 1990c:37-106). Nevertheless, the relative extent of housing production in Arak was much lower than in the Markazi province but higher than in the whole country during 1976-1986 (Table 7.2).
Another issue concerning the impact of post revolutionary land policies is tenure. As noted in Chapter Three, post revolutionary urban land policies were initiated to respond to housing needs and the ULO was established to acquire land and distribute it among people. Since then, owner occupation became a target for the ULO as well as for the people. However, the evidence indicates that despite enormous land distribution by the ULO, the proportion of owner occupiers in Arak had not increased. Whilst owner occupation in 1976 was 67 per cent, it increased only to 67.3 per cent in 1986. In fact, the rate of owner occupation in Arak was the lowest amongst all similarly sized provincial capitals in Iran. The most important reasons for this appear to be the higher population growth rate and higher migration to Arak in comparison to other similar cities (MHUD, 1992e and Hamoon
Consultants, 1990a:109 and 1990c:44). Furthermore, the owner occupation indicator was less than those for both the Markazi Province as well as the whole country (Table 7.3).

Table 7.3 Owner occupation comparison between Arak, Markazi Province and Iran in 1986

<table>
<thead>
<tr>
<th></th>
<th>Arak</th>
<th>Markazi Province</th>
<th>Iran</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67.3</td>
<td>77.1</td>
<td>76.4</td>
</tr>
</tbody>
</table>

Source: Adopted from various tables MHUD, 1992e.

To measure the situation of these indicators in Arak, a comparison was made to those in other cities in the Markazi Province and Iran. As Figure 7.2 reveals, the overall level of overcrowding (number of persons per dwelling as well as number of families per dwelling) in Arak has been better than in other cities in the province as well as in the country. Furthermore, in 1986, Arak's overall housing conditions including the number of rooms per dwelling and the number of rooms per family
were greater in comparison with the urban areas of the province, as well as those of the whole country (Hamoon Consultants, 1990c:40).

Housing needs

The effectiveness of the implementation of the new policy in terms of land supply is one of the focus areas of this study. The argument regarding housing needs is therefore presented here to show the overall land demand which will be discussed in Chapter Eight. Two major issues, overcrowding and population growth, were found to be the most influential factors affecting housing needs. The first issue in relation to housing demand is concerned with the overcrowding problem that has been one of the major problems in the past as well as present. In 1977, there was an absolute housing shortage amounting to some 5,000 units (Group-9 Consultants, 1978:62).

Table 7.4 Overcrowding: the number of dwellings by family in 1966

<table>
<thead>
<tr>
<th>Number of families per dwelling</th>
<th>Total number of dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5,666</td>
</tr>
<tr>
<td>2</td>
<td>1,959</td>
</tr>
<tr>
<td>3</td>
<td>700</td>
</tr>
<tr>
<td>4</td>
<td>233</td>
</tr>
<tr>
<td>5</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>112</td>
</tr>
<tr>
<td>Total</td>
<td>8,758</td>
</tr>
</tbody>
</table>


Despite reductions in overcrowding in Arak since the revolution, the problem of overcrowding has not been solved. The number of families per dwelling decreased from 1.34 to 1.10 during 1976 and the decade after. The number of persons per room decreased from 1.80 to 1.36 persons over the same period. Further, the number of persons per dwelling decreased from 6.39 to 5.29. However, despite dwellings increasing to 45,614 units in 1983, the average number of families living
in each unit was 1.14. In 1986, the number of families was 55,089 and the number of dwellings was still 49,137 units (SCI, 1988b:19, Hamoon, 1990b:105 and Arseh Consultants, 1986a:145). Table 7.5 compares these figures in Arak, Markazi province, Iran and other similar sized cities in Iran.

Table 7.5 Overcrowding indicators in Arak, Markazi Province, Iran, and other similar sized cities in 1986

<table>
<thead>
<tr>
<th>City</th>
<th>No. of Persons per room</th>
<th>No. of Families per dwelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>1.49</td>
<td>1.18</td>
</tr>
<tr>
<td>Markazi Province</td>
<td>1.28</td>
<td>1.14</td>
</tr>
<tr>
<td>Arak</td>
<td>1.49</td>
<td>1.12</td>
</tr>
<tr>
<td>Kerman</td>
<td>1.33</td>
<td>1.11</td>
</tr>
<tr>
<td>Hamadan</td>
<td>1.49</td>
<td>1.27</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>1.51</td>
<td>1.13</td>
</tr>
<tr>
<td>Zahedan</td>
<td>1.59</td>
<td>1.30</td>
</tr>
<tr>
<td>Orumiyeh</td>
<td>1.62</td>
<td>1.14</td>
</tr>
<tr>
<td>Zanjan</td>
<td>1.66</td>
<td>1.18</td>
</tr>
<tr>
<td>Rasht</td>
<td>1.66</td>
<td>1.24</td>
</tr>
<tr>
<td>Khorramabad</td>
<td>2.05</td>
<td>1.32</td>
</tr>
</tbody>
</table>

Source: Adapted from various tables, MHUD, 1991b.

Since the establishment of heavy industries in Arak, rapid population and family growth became a principal influence upon housing demand. However, there has been a big difference between what was predicted in master plans and what took place. While in 1977 it was estimated that the total housing demand would increase to 52,440 units by 1991 (Table 7.6), the actual number of families was 56,161 in 1986. In spite of the fact that housing conditions in Arak were better than those in other urban areas of the province and the country, they still needed improvement. Reaching goals such as one family per dwelling and one person per room requires an increase in housing production. In the initial master plan of 1966, it was estimated that 51,248 new dwellings would be needed by 1991 in order to reach one family per dwelling assuming a five-person family (Eshragh: n.d, p.62). Apart from public housing (dwellings constructed for either governmental organisations or industrial enterprises), the housing shortage was 24 per cent of the housing stock in
1984, the year before the initiation of the new urban land development policy. The housing demand estimated in the master plan of 1986 was between 2,900 and 4,450 units per year by 1994 (Arseh, 1986, Vol. 2, page 55). As can be concluded from the figures estimated in the planning process through the preparation of master plans, there has not been an accurate estimation of housing demand in Arak.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total housing demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>-</td>
</tr>
<tr>
<td>1981</td>
<td>22,120</td>
</tr>
<tr>
<td>1986</td>
<td>40,325</td>
</tr>
<tr>
<td>1991</td>
<td>52,440</td>
</tr>
</tbody>
</table>


**Housing by type and quality**

An examination of existing types and quality of housing in Arak is presented here to indicate their implications regarding physical expansion of the city. Houses in Arak, excluding squatter settlements and unauthorised shacks, generally consist of three types of structures including traditional houses, detached/villas and apartments. However, traditional houses and detached/villa units dominate the housing stock, resulting in a low density pattern of development. Traditional houses are attached units, one to two-storeys high, and built of mud or cement blocks. Detached/villas are dwellings of one to two-storeys, built of reinforced concrete with open space outside, and surrounded by a two-metre high wall.

In 1978, 71.0 per cent of all residential buildings were of one-storey, 26.7 per cent of two-storeys and 2.3 per cent of three or more storeys. The extent of detached housing led to very low-density urbanisation. Arak, as will be discussed in the next section, has serious land supply constraints. One of the substantial results of low
density pattern is a high cost of providing infrastructure. Differences in infrastructure costs will be indicated in next chapter through the examination of different density patterns in new land development projects.

There has been considerable scope for urban consolidation in Arak, particularly since its industrialisation. Medium size and high rise buildings were introduced by agencies involved in the industrialisation scheme and were found mainly in zones built by the agencies for industrial employees. In Industrial Town, some buildings up to eight storeys have been built. Nevertheless, until 1978, apartments comprised only one per cent of the housing stock. This indicates that the policy of increasing density since industrialisation was not very effective. The immediate post-revolutionary patterns of land distribution - distribution of lots to individuals- also aggravated this problem so that the proportion of apartments increased to only 2.3 per cent by 1983. However, since 1984, as it was discussed in Chapter Three, the proportion of medium and high density buildings increased, although the decision-making about density was a crucial stage. This will be discussed in next chapter in the context of more recent planned developments. In 1986, the proportion of one-storey units in new dwellings was 17.4 per cent, two-storeys was 50 per cent and three or more was 32.6 per cent (Hamoon Consultants, 1990c:38).

Another concern of housing conditions in Arak is related to the quality of dwellings. In 1956, 60 per cent of dwellings were built of mud and 21.9 per cent of mud and brick. In 1966, substandard dwellings (made from sun-dried clay or mud) still dominated the housing stock, amounting to 80 per cent of all dwellings. Over 41 per cent were of mud and wood and 24.3 per cent of brick and mud (Eshragh, n.d., pp. 23-25). Although the percentage of dwellings built of mud brick and wood decreased from 60 per cent in 1966 to 35 per cent in 1976 and 23.4 per cent in 1983, the absolute number of this type of dwelling increased from 5,297 to 6,536 units in the same period and reached 10,263 in 1983 (Arseh Consultants, 1986, Vol. 1, page 156).
The reason for the increase in absolute number of substandard dwellings was mainly related to rural-urban migration by low income groups. Nevertheless, as can be seen in Table 7.7, overall housing quality in Arak was much better than in the province and the whole country in 1986. An examination of housing in Arak by age and quality suggests that the estimation of housing demand should consider not only the present housing shortage and quantitative needs of new population, but also the condition of housing stock by type and quality. The quality of dwellings from the point of accessibility to services such as water and electricity is also discussed in the next section of this chapter under the heading of infrastructure.

Table 7.7 Comparison of housing quality in Arak, Markazi Province and Iran in 1986

<table>
<thead>
<tr>
<th></th>
<th>Iran</th>
<th>Markazi Province</th>
<th>Arak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard dwellings (structure), %</td>
<td>41.7</td>
<td>55.7</td>
<td>82.6</td>
</tr>
</tbody>
</table>

Source: Adopted from various tables, MHUD, 1991b.

In the context of housing institutions, housing production in Arak, as well as other Iranian cities, has been dominated by construction by individuals. After land is supplied, construction permission is obtained from municipalities, and people proceed to construct their houses through the appointment of individual private architects and developers (bricklayers). In Iranian cities, public housing is a relatively small proportion of the total housing stock and it is primarily relevant for governmental institutions or employer-provided housing instituted as temporary accommodation for their employees. In 1986, the total number of institutionally-provided dwellings in Arak was 4,200 (Hamoon Consultants, 1990c:38). Furthermore, the number of residential units provided by the government amounts to only five per cent of all dwellings, which is far from sufficient to accommodate
the demand of population growth. Therefore, the majority of housing construction in Arak (95 per cent) has been undertaken by the individual owners.

Indicators such as the demand for new housing, replacement of aged housing and the pattern of low density housing are factors influencing the continuation of the expansion of Arak. However, in general, there has never been any effective comprehensive plan for housing in Arak. In 1992, the provincial office of the MHUD in Arak produced a short report regarding the housing sector on the Markazi Province (Markazi MHUD, 1992b). This report attempted to give a picture of the sector containing some basic and general information about population growth, housing stock and demand in the province, but had no specific information about the province's cities including its capital, Arak. Because of the remarkable diversity between urban areas and rural areas, as well as between Arak -as the capital, largest city and fastest growing city- and other cities in the province, such a report could not adequately address the housing sector in Arak. The only attempts towards this may be seen, perhaps, in the implementation of the new urban land development policy through new projects. In the preparation of each project, attention to some extent, has been paid to the housing sector in Arak. This will be fully discussed in the next chapter.

The rapid population growth of the city gave rise to many problems. Such additional population will require more housing, employment, service and facilities. As noted in different stages of this study, three key concerns of the phenomenon of rapid urban expansion are sufficient land supply, adequate infrastructure provision and the environment. Environmental problems include the conversion of agricultural land to urban uses and the provision of adequate physical infrastructure including safe water and sewerage systems. Therefore, these concepts are argued in the following section to be the key problems of the physical expansion of the city of Arak.
7.3 Physical constraints of land supply

While according to the post revolutionary urban land policies there have been fewer problems with land acquisition, the most serious constraint on housing and urban development in Arak has been the limited availability of land in the built-up and surrounding areas. The physical environment of the city has influenced its development and restricted the expansion of the city in certain directions. The two major factors which have influenced the city's expansion are its topographical conditions and agricultural land. Since industrialisation, a third factor, the industrial zone, has appeared as another restriction on the physical expansion of the city.

The two main topographical features of Arak are its southern mountains and western hills (Figure 6.3 in Chapter Six). The mountains in the south and west have naturally oriented the city's urban development in a northern and easterly direction. The height of mountains in the south and west ranges from 2,700 metres to 3,400 metres above the sea level. The north of the city is generally flat. The average slope from south to north is 1.74 per cent and from west to east is 1.5 per cent, while it is 10 per cent in the south and western peripheries. Hence there are minor limitations to the city's expansion to the north. However, this is mainly agricultural land and there has been a great debate whether it should be converted to urban use. On the basis of the new master plan, some 540 hectares of agricultural land located in the north was suggested to be converted to urban use. By adding this amount of agricultural land, the total area of the city can accommodate a maximum population of 540,000. If this land was not added, it can respond to a maximum population of 450,000 (Hamoon Consultants, 1990a:86 and Arseh Consultants, 1986, Vol. 2, pp. 34-59).

The industrial zone located in the east is the third physical restriction for the city's expansion. Several problems arise with respect to the expansion of the city in this
Firstly, the large industrial zone which is located adjacent to the city is a physical obstacle for contiguous expansion of the city. Secondly, the land located beyond the industrial zone is agricultural land. In addition, this land has been reserved for the future expansion of the existing industrial zone. The area of the industrial zone is expected to increase by the time of completion of industries. If the land beyond the industrial zone is considered for discontiguous development of the city, the costs of infrastructure would be higher.

The policy of urban consolidation can be implemented in two ways including the development of vacant land and increase in density in built-up areas. However, the extent of existing vacant land is not considerable as a potential to respond to population growth. In 1984, the total built-up area was 2,178 hectares, of which only 110 hectares was vacant land. If this vacant land were to be developed, some 10,000 people could be accommodated. However, in that year, there was a relatively large amount of vacant land within the city's legal boundary, amounting to some 1,050 hectares. If these vacant lands were developed on the basis of the population density considered in the initial master plan, the total population of the city would reach 360,000, which is more than that projected in the plan. Further, the built-up area was not developed on the basis of the initial master plan (Arseh Consultants, 1986, Vol. 2, pp. 34-35).

In this regard it can be suggested that urban consolidation in the built-up areas of the city is not efficient for two reasons. Firstly, as shown previously, there is little vacant land in the built-up area. Secondly, the city has several serious infrastructure and public facility problems. With respect to basic infrastructure items, particularly water supply, the city has already confronted problems, as will be argued in the following section. Furthermore, the installation of improved public facilities such as schools, health centres will require more land. The most significant problem of this type concerns open spaces. The proportion of open and green spaces in Arak to the whole area of the city is amongst the lowest of all Iranian cities.
It may be suggested that urban consolidation can be implemented through increasing
the density of built-up areas as well as that of new areas. This, too, has some
limitations. In 1986, different alternatives were put forward by the city's planning
consultants. Different population forecasts and different density considerations
influenced the amount of land required. It was estimated that total land needed until
1995 was a maximum of 4,200 hectares. This amount would decrease to 2,088
hectares if a 150-persons per hectare density was considered. However, as a result of
this density increase, the per capita gross floor space would decrease to 36 square
metres (decreasing 10 per cent from existing conditions). This decrease in size of
dwellings was recommended in the master plan of 1986 in order to use land more
efficiently and also because of the limitations in building materials (Arseh
Consultants, 1986, Vol. 2, pp. 35-56). While the per capita floor space in the whole
country was 30 square metres in 1986 (MHUD, 1992a:24), the suggested floor space
in Arak is likely to be reasonable. Nevertheless, the amount of released land through
the increase in density is still far from the needs of oncoming new population.
Nevertheless, the implementation of urban consolidation can be considered through
the development of new projects whose potential and limitations will be discussed in
the next chapter.

The final suggestion in response to land demands in Arak has been made through
the policy of discontiguous expansion. In the final report of the master plan, it was
strongly suggested that in the first five years of implementation of the plan (1985-
1990), site selection for discontiguous expansion of the city was essential. The
reasons for the suggestion were, limitations on water, existence of infrastructure and
transportation, particularly in the central area. If the city expands to the north, much
agricultural land will be converted into residential uses in the same way as large
amounts were converted informally and illegally in the past (Arseh Consultants,
1986, Vol. 2, pp. 29 and 34). Furthermore, as discussed previously, the policy of
creation of new cities was initiated by the MHUD parallel to the new urban land
development policy in order to house new populations of large cities as well as the needs of specific cities such as Arak with new industrial functions. The new town of Mohajeran, being developed for Arak's new industrial zone, is one of these new cities and its potential response to population growth and land demand will be discussed in the next chapter.

7.4 Key infrastructure elements

The problems of the provision of infrastructure are perhaps the most important issues in the context of urban land development in Arak. The city of Arak already possessed its own infrastructure problems prior to the revolution and before the initiation of the new policy towards urban land development in 1985. As noted in the previous chapter, several squatter settlements and shanty town areas appeared in the city before the revolution. Based on its regulations, the municipality could provide services only within a delineated boundary. Therefore, those who lived in squatter settlements outside the legal boundary suffered from a lack of services. It was stated in the 1978 detailed plan that these people should now be accepted as citizens (Group-9 Consultants, 1978:19). The problems of infrastructure were aggravated after the revolution. The majority of lots that had been distributed by the ULO before 1985 were affected by the construction of second storeys, either legally or illegally. This increased the population density of some areas, whereas the required services (roads, schools, commercial, open space, health facilities) remained at the previous levels of provision (Arseh Consultants, 1987).

Lack of appropriate data on each infrastructure element in Arak has been a major problem in planning as emphasised by the provincial MHUD's office in Arak. In 1992, the provincial MHUD office (Markazi MHUD, 1992a:11) listed 10 characteristics of infrastructure inadequacies in the province's cities:

- Water networks were inefficient,
• Amongst three water consumption sectors—agriculture, industry and urban uses—residents had the highest consumption level,

• Water reservoirs had experienced decrease in water levels,

• There were no sewerage filtration plants,

• Some cities did not have even chlorination facilities,

• Water networks were worn out (eroded) in all cities,

• There was not any sewerage system in cities, and the city of Arak was in the worst condition,

• Lack of adequate infrastructure to protect against natural disasters such as flooding,

• Apart from the national road connecting Tehran to the South through Arak, regional transportation was a major problem.

An overall picture of residents' accessibility to basic infrastructure is first presented here. Then the condition of each of the key infrastructure elements, including water, sewerage, roads and drainage systems, is discussed separately. Before presenting the figures of households' access to basic infrastructure, including water and electricity, the relevant information should be accurately manipulated. There are differences between the access of dwellings and families to infrastructure. The reason for these differences is related to the pattern of overcrowding and the issue of homelessness in Arak, as well as in all Iranian cities. As noted in Chapter Three, those families who did not possess a house were usually living with their parents or relatives; living in such places as the streets is rare. Therefore, mainly for this reason, there was only one tent and 29 huts in Arak in 1986 (SCI, 1988b:19).

If a dwelling unit with more than one family does not have access to piped water or electricity, this implies that two or more families do not have access to these services. As such, in 1986, 98.4 per cent of dwellings had piped water but only 83.4 per cent of families had access to this service. In 1986, 98.4 per cent of dwelling
units had electricity, but 97.8 per cent of families had access to this service (SCI, 1988b:19). During the period of the immediate post-revolutionary land development policies, rapid housing provision had negative effects on the accessibility of dwellings to basic services. The proportion of families with piped water decreased from 88.5 per cent in 1976 to 83.4 per cent in 1986 (Hamoon Consultants, 1990a:107). This can be seen as the consequence of mass housing provision with inadequate infrastructure provision.

<table>
<thead>
<tr>
<th>Table 7.8 Infrastructure conditions in Arak, the province and Iran in 1986, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Families with</td>
</tr>
<tr>
<td>piped water</td>
</tr>
<tr>
<td>Arak</td>
</tr>
<tr>
<td>Markazi Province</td>
</tr>
<tr>
<td>Iran</td>
</tr>
</tbody>
</table>

Source: Adopted from various tables, MHUD, 1991b.

As can be seen in Table 7.8, the conditions of water and electricity supply in Arak were worse than those in the whole country. While the figures of the whole country consists of all areas including urban and rural areas, this implies that Arak has generally had one the worst urban conditions in Iran. Water supply depends on external factors including water resources, networks and administration, which are beyond the control of Arak's residents. Further, as noted previously, there were many illegal dwellings built in areas beyond the municipal boundaries. Consequently, the water board could not legally supply them with water. The only exemption is related to the proportion of families with telephones which was higher than both the province and the whole country. The city of Arak is located in one of the more developed regions of the country and the needs of sufficient communication in the context of industrialisation, resulted in a relatively higher number of telephones.
Electricity is not usually as important as other infrastructure elements for two reasons. On the one hand, as was shown above, the proportion of dwellings and families with access to electricity has been much higher than other elements. On the other hand, the provision of electricity is beyond the city administration and planning. Electricity for Arak is supplied through the national network (Markazi PBO, n.d.). Therefore, the next section focuses on the other four key infrastructure elements including water, sewerage, roads and drainage systems.

Water and sewerage

Water supply in Arak is administered by the Arak Water Board within the Ministry of Energy. The board is responsible for the maintenance and development of water resources and for related services such as wells and reservoirs. It is also responsible for the construction and operation of the water systems, the collection of fees, management, and the maintenance of water inside the city boundaries. Arak's water is drawn from underground reserves. In 1983, there were ten new wells with 40 litres per second for each and ten old wells with 2 to 10 litres per second. The amount of water captured from these wells was 700 litres per second for the whole city in 1986. The depth of underground water levels ranges from 15 metres to 65 metres depending on topographical conditions. The depth of wells ranges from 100 metres to 120 metres (Arseh Consultants, 1986, Vol. 1, page 128). Amongst all infrastructure elements, water supply is perhaps the most important constraint in the process of Arak's expansion. The problems of water supply in Arak are several.

The first issue of water supply in Arak concerns the capacity of resources. The water resources are limited and the availability of water from wells depends on the amount of yearly rainfall which is variable, thus affecting the reliability of the water supply for the city (Ministry of Energy, 1991). There have been various suggestions for the capacity of water supply in Arak. This variation arises from inefficient planning.
process for water supply. An example of this inefficiency can be seen in the implementation of infrastructure in new land development projects as will be argued in the next chapter. In 1968, the former Ministry of Water and Electricity predicted that the city could provide water for a population of 300,000 until 1991 and this estimate was taken into consideration in the preparation of the first master plan. In 1983, the Ministry of Energy predicted that the maximum population that Arak's water capacity could support would be 400,000 by the year 2001. There has been a more recent estimate that water reserves could supply a population as high as 480,000. Therefore in the latest master plan, approved in 1985, a contiguous expansion form of the city was considered on the basis of the latest water capacity (Arseh Consultants, 1986, Vol. 1, page 93). Plate 7.1 shows an example of water supply problems in an unplanned area.

Plate 7.1 The unplanned Cheshme Mooshak area (Autumn season, 1994)
Developed on steep hills. Water tanks are erected on top of dwellings to overcome the lack of water supply.
Source: Author.
The second concern is related to infrastructure for industries. Examination of the master plan makes it apparent that at the time of the establishment of the industrial zone, the question of the sufficiency of water for industries as well as drinking water for the city was never considered. The industrial zone uses its own wells thus lowering the level of underground water. Consequently, surrounding rural farmland has confronted agricultural water shortage, increasing rural-urban migration, particularly to the city of Arak (Arseh Consultants, 1986, Vol. 2, page 4). Moreover, recent plans to establish new industrial zones with petrochemical processing and oil refinery, are expected to aggravate this problem. The amount of water demand for the two new heavy industries is 1,200 litres per second which itself is three times the present total Arak consumption.

There are also other concerns in the process of water supply in Arak such as an increase in per capita daily consumption of water. In the initial master plan, per capita water consumption was estimated to be 150 litres per day for 1981 and 180 litres for 1991 (Eshragh, n.d., page 86). In 1985, while per capita water consumption was 130 litres, with the expected expansion of economic activities, it was estimated to increase to 200 litres per day in the future (Arseh Consultants, 1986, Vol. 2, page 50). Another concern is related to the maintenance of the water network. The water network of the city has had several problems including old pipes which cannot work efficiently.

The lack of sewerage systems and sanitation concerns are serious problems in Arak. As noted previously, the majority of Iranian cities do not have access to sewerage systems. In Arak too, with the exception of planned residential areas developed for industrial employees, the city does not have any comprehensive sewerage system. All urban waste including that from the industrial zone is interred in the ground. Lack of comprehensive sewerage system may result in underground water pollution. In some fringe areas where dwellings have been built on rocky ground, sewerage

Roads and drainage systems

The municipality of Arak, like other Iranian cities, is responsible for roadworks, drainage systems, public open spaces and recreation facilities, as well as services such as garbage removal. Providing these services in Arak is problematic. The first problem concerns the administrative capacity and limited technical expertise in the municipality of Arak. During the rapid expansion of the city accompanying industrialisation, the municipality had insufficient skilled personnel. In 1978, the total number of employees working in the municipality was 410, of which only 2.7 per cent had high school level education or higher. In its technical division, which was responsible for the implementation of the master plan, there were only four technicians and surveyors. There was neither an architect nor a planner working for the municipality. One of the implications of the administrative deficiencies of the municipality has been its inability to spend its annual budget. From 1976 to 1984, only 83 per cent of its annual budget, channelled by government, was spent. This means that the administrative capacity of the council was not efficient enough to absorb the whole budget (Arseh Consultants, 1986, Vol. 2, page 62).

The second concern is financial problems. Between 1976 and 1986, capital investment channelled by the government for urban development activities (mainly roads, water, electricity, drainage and sewerage systems) in the Markazi province dropped from 23.5 per cent of the whole municipal budget, gaining the highest proportion of funding of all activities, to 13 per cent by 1989 (Hamoon, 1990a:46). In the period 1986 to 1989, all municipalities in the province confronted financial problems (see Table 7.9). The statistics revealed that government investment dropped dramatically by 64 per cent in that period. The per capita income of municipalities dropped by 46.5 per cent and per capita expenditure dropped by 44
per cent (Markazi MHUD, 1992a:10). Further, while the industrial zone put great pressure on the city’s resources, industry did not pay any taxes because it was not located within the municipal service boundaries (Group-9 Consultants, 1978:30).

Table 7.9  Income and expenditure of the municipality of Arak by current prices in selected years

<table>
<thead>
<tr>
<th>Population</th>
<th>Income (Million Rials)</th>
<th>Expenditure (Million Rials)</th>
</tr>
</thead>
<tbody>
<tr>
<td>265,349</td>
<td>302,663</td>
<td>1,184</td>
</tr>
</tbody>
</table>


The budget of the Arak municipal council increased from 202 million Rials in 1976 to 730 million Rials in 1984, averaging a 29 per cent increase per annum (Arsch Consultants, 1986, Vol. 2, page 62). However, if the population increase is taken into account, the actual increase amounts to only eight per cent per annum. Considering inflation in various sectors, including the costs of services and materials, it is apparent that the budget had already decreased. Furthermore, in more recent years, the public budget of the municipality has been reduced. While in 1986, 20.1 per cent of the municipality's income was granted by the Interior Ministry, this proportion decreased to 13 per cent in 1988. The grant from the provincial budget was also totally cut out in 1987. Consequently, the municipality has had to increase its income through its activities within the city. Income from local activities increased from 77 per cent to 84 per cent in the same period (Hamoon Consultants, 1990a:126). Therefore, attempts have already begun to divest the municipalities of their capability to provide essential services. Plate 7.2 shows an example of inadequacies in the provision of roads and drainage systems in an unplanned area.
The third problem concerns the cost of infrastructure provided by the municipality. Roads and drainage systems are the most expensive items amongst all infrastructure elements for new residential areas. The extent of these elements will be shown for new projects in the next chapter. The reduction of financial resources of the municipality, as shown above, could give rise to many problems relating to transport in the new areas and environmental considerations. A new approach is therefore required considering constraints on what the community can afford, and to make new and existing investments more productive. Parallel to the reduction of the municipal funds, the user-pays system was initiated by the MHUD to finance new residential areas. The effectiveness of this system as applied in Arak will be investigated in the next chapter.

7.5 Conclusion

In the previous chapter, factors influencing rapid urban expansion in Arak were examined. This chapter identified specifically those problems related to land development. The first concern was considered to be a very high housing demand
together with poor conditions of housing stock. Despite massive housing production and land distribution in the post revolutionary period by the ULO, there remains a serious problem of housing shortage.

The second problem was identified as the physical constraints of land supply in Arak. Physical characteristics of the city and surrounding areas and lack of potential for growth and expansion were examined. The most significant finding was that despite awareness of land supply limitations, even recognised since its industrialisation and prediction of rapid growth, the city has been expanding over time and master plans failed to control its expansion. A large amount of agricultural land and gardens was converted to urban use and illegal settlements took place in the fringe that were not suitable for residential area, located on hills. Several suggestions have been made in response to land demands in Arak. However, using vacant land and implementation of urban consolidation policy has many limitations due to the lack of sufficient open and green spaces, and inadequacy of existing infrastructure and public facilities.

The third type of problem was concerned with infrastructure provision. Water supply and roads provision are the primary problems. The ultimate population projection for water supply has changed over time ranging from 300,000 to 480,000 population. This process implies that there has not been an effective planning for water supply. Regarding the provision of roads and drainage systems, the municipality of Arak has confronted two important problems, including the lack of skilled staff in the municipality for development control and provision of infrastructure, and financial constraint. The next chapter will examine the contemporary responses to land development pressure in Arak to find out how the government has tackled these problems in recent years.
Chapter Eight

CONTEMPORARY RESPONSES TO LAND DEVELOPMENT PRESSURE IN ARAK

8.1 Introduction

Since 1985, the city of Arak has begun to experience new programs parallel to the implementation of the new urban land development policy in Iran. This chapter examines the recent land development outputs in land supply and infrastructure provision and certain interrelationships with the physical environment.

The new projects implemented in Arak are examined here by means of a cross-case analysis (Yin, 1984:131). Each section is devoted to a separate issue and information from individual projects is dispersed throughout the chapter. This analysis is significant for two reasons: firstly, the discussion underlying issues such as land supply and infrastructure provision is of national importance. These projects may be seen as examples of many that were implemented under the new policy since 1985. Secondly, these projects are analysed in detail to find out the impact of new policy in responding to the problems arising from a rapidly expanding city such as Arak.

Even though the projects vary in their detail such as in area, location, density and commencement date, a general illustration can be advanced that fits each of the individual cases. First, a brief and general overview of these projects is presented. Then, the planning process for these projects will be discussed in which land use patterns emphasising the impact of density decisions on land development policy are examined. The result of implementing new projects is analysed within the various issues raised in the context of this study. These issues consist of responses to housing and land demand and infrastructure provision.
8.2 Recent land development projects in Arak

An overview of new projects

Between 1985 to 1991 six new land development projects together with a new town were developed in the city of Arak (Table 8.1). Among these, four projects were found to be important because of their size and their impact on the city (Figure 8.1). A general overview of the projects is presented here. The purpose of this description is that these projects are identified as the contemporary responses to land development pressure in Arak. As such, they are examined throughout the chapter in all aspects including: planning and implementation processes, costs, responses to land and housing demand, and the environmental considerations.

The first project of "70-Hectare Project" is well known as the E & F subdivision of a large site namely Majmoeh-e Panjhezar Vahedi [a 5,000-unit site]. This area was already divided into several sub-areas named A, B, C, D, E and F. This project was initially related to the ULO's activities before the initiation of the new policy and its plan was prepared by the provincial ULO (see Figure A.3.3 in Appendix 3). However, at the time of distribution of its lots, the new policy was introduced and covered the remaining stages of the implementation process. Because its lots were already allocated to applicants there was little opportunity to revise the plan. Only infrastructure was supposed to be provided under the new policy.

The second important project commencing in 1985 was Gerdoo Project which initially comprised 79 hectares of land located in the south-west of the city. Nine hectares was owned by the religious organisation, Vaqf; therefore, in practice, the developable land for use by the ULO was 70 hectares. It is located between the railroad and the southern ring road of the city. This project was the most difficult to accomplish from the point of view of physical condition. East of the site the terrain
Figure 8.1 Location of new land development projects in Arak

Source: Author.
is very mountainous and the only linkage to the city is from the north. The site was designed to offer a choice between houses and apartments.

Table 8.1 Overall information about all projects in Arak, 1985-1991

<table>
<thead>
<tr>
<th>Projects</th>
<th>Area (ha)</th>
<th>Year commenced</th>
<th>Agreement sum (m. Rials)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 hectare</td>
<td>70</td>
<td>1985</td>
<td>1,020.834</td>
</tr>
<tr>
<td>Gerdoo</td>
<td>79</td>
<td>1985</td>
<td>971.500</td>
</tr>
<tr>
<td>Shomal Gharb</td>
<td>16</td>
<td>1987</td>
<td>171.400</td>
</tr>
<tr>
<td>102-hectare</td>
<td>102</td>
<td>1987</td>
<td>1,180.140</td>
</tr>
<tr>
<td>Sorekan</td>
<td>4</td>
<td>1989</td>
<td>58.240</td>
</tr>
<tr>
<td>Shomal Shargh</td>
<td>41</td>
<td>1990</td>
<td>1,025.517</td>
</tr>
</tbody>
</table>

* As noted in Chapter Five, to start the implementation of a new project, it was necessary to arrange an agreement between the DHA and the relevant provincial office of MHUD. This agreement contained general information on the projects including a preliminarily agreement on the proposed costs. However, during the implementation of projects, these amounts might be changed for reasons such as change in the size of projects, implications of different densities, inflation and unpredicted costs.

Source: Adopted from ULO, 1992c.

The third important project, the "102-Hectare Project" located next to the Majmoeh-e Panjhezar Vahedi, was started in 1987. The total area of the site (after subtracting the public right of way) was 96.7 hectares. In the early years of plan preparation, the site was intended to be implemented through a regular process similar to other projects. However, in 1991, the MHUD decided to develop the site through a government company called Sherkat-e Sarmayeh Gozari-e Bank-e Maskan [Capital Investment Company of Housing Bank] under the Maskan Bank [Housing Bank]. The company was responsible for the construction of mass housing mainly of medium density buildings. It was also responsible for the provision of site infrastructure, including roads, drainage systems, water reticulation and sewerage.

The fourth important project was establishing the new town of Mohajeran, located 28 kilometres to the west of the city of Arak, on the Tehran-Khusestan road (Figure 8.2). As mentioned in Chapter One, the new cities policy was initiated in 1985 to
Figure 8.2 Location of Mohajeran new town

Source: Based on Parhouse Consultants, 1992b.
cope with the problems of large metro areas and centres with particular functions, such as growth poles. The initial development objective of Mohajeran new town was to respond to the needs of two new major industries including an oil refinery and petrochemical works (see Mardokhi, 1992:48). The area proposed in the first plan was 700 hectares with a target population of 70,000. The final layout was 834 hectares and provided for a population of 75,000. In 1992 the total area of the new town was increased to 1,820 hectares.

In July 1987, Housing and Development Service Corporation (HDSC) was selected as the consultant for planning and design of Mohajeran new town, and the creation of this new town was approved by the High Council of City Planning and Architecture in the following year. In the first stage, 300 hectares were planned as a land development project (similar to the other land development projects). In terms of institutional arrangements, the MHUD established a central development corporation for new cities in Tehran in accordance with the article 11 (5) of the ULL. Further, for each new city, a development corporation was established at the local level and the Mohajeran City Development Corporation was created in Arak.

In addition, as mentioned above, three other projects have been developed since 1985. However, these projects are not considered as key ones affecting the land development process in this analysis for three main reasons. Firstly, their size is small and they had little effect on the process of land development in Arak. Secondly, there was not enough data available for inclusion in this assessment. Thirdly, their lots were already allocated to applicants and, consequently, the policy only covered the final stages of the implementation process. These projects were as follows. The first project covered 16 hectares of land (originally 20 hectares) and is located to the north of the city. The second was Sorekan, the smallest in the city, covering only four hectares of land. The final project was that of Shomal Shargh which commenced in 1990, covering 41 hectares of land. Like the first 70 hectare project, the lots in these two last projects were already allocated to applicants.
Planning: site selection, design and land use patterns

One of the most serious constraints on housing in Arak has been the limited availability of land for new development. As noted in Chapter Seven, in the south and west, mountains and hills dominate the city. To the north and north east, the land is generally flat. However, growth in these directions presents two problems. Firstly, it is agricultural land and secondly, the industrial zone located in the east is an environmental and physical obstacle. Among six new projects, five were already proposed as residential sites in the city's master plan. One - Gerdoo Project - was located beyond the boundary but it was considered as a possible extension of the city under higher density conditions. This site offered the last expansion possibilities for the city in this direction. As noted above, among all new projects, three were the most important and feasible for investigation. Regarding the relatively large project, the "70-Hectare", there was not enough data available. The sizes of the two others, "Shomal-e Gharb" and "Sorekan", were not considerable for inclusion in this analysis, also there was not data available.

The Gerdoo Project was considered a "community neighbourhood", and included a community centre designated for the site together with a hierarchy of services (Figure 8.3). Land and housing indicators were considered as follows: 25 square metres per capita floor space for houses, and 21.5 square metres for apartments. While a large community was defined by the consultants as having a population between 8,000 to 10,000, in total, 4,544 dwellings with population of 20,900 were planned for this project. The average per capita residential land area contained in the project was 18 square metres (Arseh Consultants, 1986, Vol. 2, page 42 and 1987:48). Overall land use in this project is shown in Table 8.2.
LEGEND:

- Low density residential (1-storey dwellings)
- High density residential (4-6 storey dwellings)


Figure 8.3 The Gerdoo Project
Table 8.2 The land use pattern in the Gerdoo Project

<table>
<thead>
<tr>
<th>Land use</th>
<th>Area (Sq. m.)</th>
<th>Land per capita (Sq.m.)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational</td>
<td>36,400</td>
<td>1.74</td>
<td>4.61</td>
</tr>
<tr>
<td>Health</td>
<td>3,100</td>
<td>0.15</td>
<td>0.39</td>
</tr>
<tr>
<td>Sports &amp; Green spaces</td>
<td>104,500</td>
<td>5.00</td>
<td>13.23</td>
</tr>
<tr>
<td>Commercial</td>
<td>20,900</td>
<td>1.00</td>
<td>2.65</td>
</tr>
<tr>
<td>Administrative</td>
<td>7,300</td>
<td>0.35</td>
<td>0.92</td>
</tr>
<tr>
<td>Religious &amp; cultural</td>
<td>2,100</td>
<td>0.10</td>
<td>0.27</td>
</tr>
<tr>
<td>Main roads</td>
<td>96,700</td>
<td>4.63</td>
<td>12.24</td>
</tr>
<tr>
<td>Local access</td>
<td>42,000</td>
<td>2.01</td>
<td>5.32</td>
</tr>
<tr>
<td>limits (public right of way)</td>
<td>100,000</td>
<td>4.78</td>
<td>12.66</td>
</tr>
<tr>
<td>Residential</td>
<td>377,000</td>
<td>18.04</td>
<td>47.71</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>790,000</strong></td>
<td><strong>37.80</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


The most important aspect of the planning process for this project was decision-making concerning density. While the average per capita floor space in the built-up areas of the city was 36 square metres in 1986, the master plan recommended that it be decreased to 32 square metres. However, the policy of urban consolidation, as was argued previously, was not applicable to existing areas because of lack of sufficient open and green spaces. On the other hand, the city had a serious problem of land supply. One approach to the policy of urban consolidation would be to increase the density in new residential areas. Nevertheless, various density patterns have different implications which will be discussed in the following section.

The "102-Hectare Project", like the Gerdoo Project, was considered to be a community neighbourhood. It contains four sub neighbourhoods in which basic local services such as schools, shops, administration and open space are provided. Further, a community centre containing a high school, commercial centre, and open space was located in the centre of the site. Overall land use and dwelling patterns in this project are shown in Tables 8.3 and 8.4. This project, like Gerdoo, was subject to decision making about increased density which will be discussed later.
Table 8.3 Land use in the final layout of the "102-Hectare Project"

<table>
<thead>
<tr>
<th>Land use</th>
<th>Total area (Sq.m.)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>557,763</td>
<td>54.9</td>
</tr>
<tr>
<td>Services</td>
<td>144,032</td>
<td>14.2</td>
</tr>
<tr>
<td>Limits (public right of way)</td>
<td>49,000</td>
<td>4.8</td>
</tr>
<tr>
<td>Roads</td>
<td>265,465</td>
<td>26.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,016,260</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Arseh Consultants, 1989:47.

Table 8.4 Density pattern in “102-Hectare Project"

<table>
<thead>
<tr>
<th>Density</th>
<th>Area (h)</th>
<th>%</th>
<th>Net density (persons per hectare)</th>
<th>Population</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10.9</td>
<td>19.9</td>
<td>265</td>
<td>2887</td>
<td>12.4</td>
</tr>
<tr>
<td>Medium</td>
<td>11.8</td>
<td>21.5</td>
<td>333</td>
<td>3928</td>
<td>16.9</td>
</tr>
<tr>
<td>High</td>
<td>19.8</td>
<td>36.3</td>
<td>436</td>
<td>8648</td>
<td>37.2</td>
</tr>
<tr>
<td>High rise buildings</td>
<td>11.8</td>
<td>20.4</td>
<td>639</td>
<td>7145</td>
<td>30.8</td>
</tr>
<tr>
<td>Mixed</td>
<td>0.9</td>
<td>1.7</td>
<td>639</td>
<td>588</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54.6</strong></td>
<td><strong>100.0</strong></td>
<td><strong>639</strong></td>
<td><strong>23,196</strong></td>
<td></td>
</tr>
</tbody>
</table>


The town of Mohajeran was planned as a new city containing all necessary services. According to its plan, it is to be the second largest population centre in metropolitan Arak and the fourth largest population centre in Markazi province following Arak, Saveh and Khomein (HDSC, 1988, Vol. 1, page 51). Some of the new population would be diverted to this new town in order to take pressure off Arak’s growth. The land use pattern in the first land development project in the Mohajeran new town is shown in Table 8.5.

The growing demand for homes and the shortage in land for building resulted in a trend towards higher densities in the city. As noted earlier, in recent years, the new policy of the MHUD was towards increasing the density of new projects to maximise use of land and prevent urban sprawl. This necessitated an increase in
population and accommodation densities. However, the change which occurred in density policy resulted in a most challenging outcome concerning the planning and design process. In the following section this crucial issue, influencing land development programs, land supply and infrastructure provision, is discussed.

Table 8.5 Land use pattern in the first land development project of Mohajeran

<table>
<thead>
<tr>
<th>Land use</th>
<th>Per capita land (Sq.m.)</th>
<th>Area (ha)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>55.0</td>
<td>135.4</td>
<td>44.2</td>
</tr>
<tr>
<td>Educational</td>
<td>8.9</td>
<td>21.8</td>
<td>7.1</td>
</tr>
<tr>
<td>Commercial</td>
<td>2.8</td>
<td>6.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Religious and cultural</td>
<td>1.2</td>
<td>2.9</td>
<td>1.0</td>
</tr>
<tr>
<td>Health</td>
<td>0.6</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Sports</td>
<td>2.0</td>
<td>4.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Administrative</td>
<td>1.0</td>
<td>2.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Green spaces</td>
<td>15.6</td>
<td>38.2</td>
<td>12.5</td>
</tr>
<tr>
<td>Roads</td>
<td>36.3</td>
<td>57.3</td>
<td>29.1</td>
</tr>
<tr>
<td>Other services</td>
<td>0.8</td>
<td>3.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>124.3</td>
<td>306.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Density: a crucial factor influencing land development

Before the initiation of the new policy, almost all land distributed by the ULO was planned at a low density with one-storey houses (Plate 8.1). When the shortage of land was addressed, it was decided that new sites should no longer be planned at a low density. During the preparation of the latest master plan in 1984, the city was experiencing considerable demand for housing and land, so the creation of a more compact city became central to the strategy proposed in the master plan. The master plan suggested a decrease in the size of new dwellings in order to use land more efficiently and also to overcome land shortages (Arseh Consultants, 1986, Vol. 2, page 38). This led to a changes in the density levels decided for new projects. An example of the implications of this strategy was the change that occurred in the
"102-Hectare Project". The first choice, approved in 1987, was based on one-storey houses covering the whole site. In the process of drafting the first plan an alternative land use pattern was prepared, allowing an increase of 300 dwellings. Instead of a one-storey plan for the whole site, medium density housing, with apartments, was recommended (Figure 8.4). Overall, three issues need to be considered in the process of decision-making about development densities; these are: demand pressures, economic aspects, and the environment.

The first and most important reason for increasing density in more recent projects was considered to be land and housing shortages reflected in demand pressures. The suggested rationales for this were: First, a high housing demand at the national level as well as in Arak. Overall shortage of land necessitated higher residential densities. In the city of Arak in 1986, 70 per cent of total dwellings consisted of one-storey housing. The average lot size in the city was 270 square metres and average floor space was 182 square metres. This was higher than in many other cities in Iran and it was higher than in many other developing countries (to compare these figures see World Bank, 1992c). Secondly, development at a higher density may result in economies of scale in the use of materials. Thirdly, medium and high density housing results in the improvement of the quality of housing because of relatively greater control over the planning and implementation process rather than construction by individuals. Finally, the existence of higher density in Arak, particularly in Industrial Town, and people's familiarity with this type of housing is likely to lead a great acceptance.
Plate 8.1 The "70-Hectare Project" in Arak (Winter season, 1993)
A low density residential development. Basic infrastructure, including roads, water, drainage system and electricity, have been provided under the urban land development policy of 1985. Low density dwellings are under construction.
Source: Author.

Plate 8.2 The Gerdoo Project showing the pressure of physical expansion
Developed under the urban land development policy of 1985 (Winter season, 1993).
Source: Author.
Figure 8.4 Plans of the "102-Hectare Project" showing different densities

Source: Based on Arseh Consultants, 1989 and 1990.
Thus, it was recommended that the both Gerdoo Project and the “102-Hectare Project” be planned at medium and higher densities. As noted earlier, the Gerdoo site was considered in the master plan of 1985 as a possible area for higher density expansion with high-rise buildings. Until then, almost all new areas of the city (with the exception of Industrial Town), either planned or unplanned, had been of low density with a predominance of one-storey houses. At the time there was concern that a higher density plan would not be accepted by the community. However, the consultants argued that the site should be planned at a high density. In the final plan, because of the housing shortage and the precedent that apartment blocks were already accepted and occupied, the density was doubled to that of the city average in order to house a population of 22,000 (Arseh Consultants, 1987:44). The net residential density, therefore, was planned at 290 persons per hectare and floor space provided 22.5 square metres per capita, with a proposed population of 4,796 households.

Conditions found in the “102-Hectare Project” differed from the Gerdoo Project in several important ways. In the first plan, the maximum population for the project was proposed to be 18,865 (371 persons per hectare net residential land or 185.6 persons per hectare of gross land). Through the redesign of small lots, some roads could be utilised for other land uses, including housing and public facilities. In this way one-third of the 18 hectares of local roads were reallocated for housing and public facilities. Therefore, the total land for facilities increased by 20 hectares. In total, the population could increase to 26,000 (257 persons per hectare gross density or 462 persons per hectare net residential land). The residential land thus allocated decreased from 26.9 square metres to 21.5 square metres per capita.

One of the main concerns in the new projects was that new densities were much higher than densities proposed in the master plan for the city approved only a year before their implementation. For example, according to the master plan, the Gerdoo
Project should have been planned for a population of 15,000, but was increased to 20,900. Indeed, if the density recommended in the comprehensive plan of 1985 (140 person per hectare) had been implemented, the project would have had population of only 11,000 (2,400 households). There were similar changes in density for the 102-Hectare Project. The gross density for this project proposed in the master plan of 1985 was 200 persons per hectare, but it was increased to 220 persons per hectare in the revised layout (Table 8.7 compares land use and densities between the initial and revised plans of this project). Therefore, it can be argued that there was a problem regarding differences between the master plan for the city and plans for new projects. If densities projected in the master plan were based on a comprehensive study of the issues, this should have been considered in the implementation processes of the new site. If it was necessary that the densities of new projects be increased, the whole plan should have been redrafted.

Table 8.6 Dwelling pattern in the initial plan, "102-Hectare Project"

<table>
<thead>
<tr>
<th>Lot size</th>
<th>Number of lots</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 150 square metres</td>
<td>255</td>
<td>12.6</td>
</tr>
<tr>
<td>Between 150-200 square metres</td>
<td>376</td>
<td>18.6</td>
</tr>
<tr>
<td>Between 200-250 square metres</td>
<td>487</td>
<td>24.0</td>
</tr>
<tr>
<td>Between 250-300 square metres</td>
<td>503</td>
<td>24.8</td>
</tr>
<tr>
<td>More than 300 square metres</td>
<td>409</td>
<td>20.0</td>
</tr>
</tbody>
</table>


Table 8.7 Comparison between initial and revised plans of the "102-Hectare Project"

<table>
<thead>
<tr>
<th>Land use</th>
<th>Area (hectare)</th>
<th>Per capita land (Sq.m.)</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revised layout</td>
<td>Old layout</td>
<td>Revised layout</td>
</tr>
<tr>
<td>Residential</td>
<td>54.6</td>
<td>50.8</td>
<td>23.5</td>
</tr>
<tr>
<td>Services</td>
<td>17.8</td>
<td>14.4</td>
<td>7.7</td>
</tr>
<tr>
<td>Main roads</td>
<td>13.3</td>
<td>13.3</td>
<td>5.7</td>
</tr>
<tr>
<td>Local access</td>
<td>10.9</td>
<td>18.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Total</td>
<td>96.7</td>
<td>96.7</td>
<td>41.7</td>
</tr>
</tbody>
</table>

As noted earlier, a major institutional shift concerning the implementation of the “102-Hectare Project” took place in 1990. The Sherkat-e Sarmayeh Gozari-e Bank-e Maskan was selected to construct medium density housing for this project. The major motivation for this decision was that high density development should be implemented by such institutions rather than via the previous process by the MHUD. The consultants revised the layout of the plan based on new guidelines and produced a design in which the maximum population changed to 22,357 (220 persons per gross hectare) a density between those projected in the initial and final plans. Two factors influenced this decision regarding density: firstly, the proposed density in the master plan and, secondly, the requirement for mixed density in the site. The final density was as follows: the total net residential land was 56 hectares and the net density was 400 persons per residential hectare. Allocation of residential land amounted to 23.55 square metres per capita (Arseh Consultants, 1990:6).

The second issue in the process of decision-making about density was concerned with economic aspects. In general, the cost of land per hectare will tend to increase as the density is increased, although the cost of land per dwelling will tend to decrease. The costs of services such as roads, footpaths, water and sewerage lines tend to decrease with more compact development. On the other hand, once density is increased beyond a certain level to include high rise buildings, the cost of development begins to rise sharply. Therefore, a moderate (medium) density was considered optimal. This would result in savings in the cost of development and would also result in more dwellings of the type and price for which there was greatest demand.

For example, in the “102-Hectare Project”, increasing density and changes in the pattern of dwellings meant that the costs of infrastructure per capita decreased by up to 23 per cent in comparison with the first plan. The most important factor here was reduction in the area of land allocated to roads which decreased from 31.4 hectares
to 24.2 hectares. The total costs of all infrastructure items decreased from one billion Rials to 774 million Rials. The per capita costs also decreased by 40 per cent from 53,350 Rials to 33,386 Rials (Arseh Consultants, 1990:24). The density of Mohajeran new town was one of the lowest amongst the new projects. The average size of residential allotments was larger than regional and national averages. The main objective of this low density decision was to attract new residents and stabilise the new town. However, this was also likely to cause higher costs in infrastructure. Two elements may have caused these higher costs. First, the proportion of land allocated to low density residential areas in Mohajeran was much larger than in the built-up areas of Arak and new land development projects. Secondly, the proportion of land allocated to roads was much larger than in other projects as well as in the city.

The third issue in the process of decision-making concerning density was that of environmental considerations. Factors such as climate, extent of agricultural land, physiography and landscape are usually considered in any plan for development. These factors were considered in new projects in Arak and had implications for design, as well as implementation process. One of the primary factors was the climate of Arak. Climate influenced the planning and design process of the city layout as well as new land development projects. Some important climatic conditions of Arak, including temperature, humidity, rainfall and wind, are presented here, and then some examples of the implications of these conditions for the land development process are discussed.

While Iran has multi-climatic conditions ranging from very cold regions in the north and west to very hot in the south and central-east, the climate of Arak is classified as temperate (mild) with a cold winter and relatively hot and dry summer. The dominant feature is the occurrence of very low temperatures in winter. While the average temperature is 14 degrees Centigrade, the absolute minimum temperature may fall to minus 28 in February while the absolute maximum temperature may rise
as high as 43 degrees Centigrade in July. In 1990, the absolute maximum temperature recorded 39.5 degrees Centigrade and the absolute minimum was -19.9 degrees Centigrade. The city averages 99 days below zero. Therefore, Arak is identified as one of the coldest cities in Iran during the winter season.

The average daily humidity ranges from 59 per cent in the morning to 37 per cent in the afternoon. The maximum humidity of the region is 92 per cent and the minimum is 15 per cent. The average annual humidity is 47.7 per cent ranging from 24 per cent in September to 74 per cent in January. Rainfall is usually highest in December/January and lowest in September, with five millimetres per day in winter and spring, and occurring rarely in summer. The average amount of annual rainfall is 380.5 millimetres, ranging between 136 millimetres to 517 millimetres. The prevailing winds are from the south-west and west, with an average speed of 50 kilometres per hour and a maximum of 90 kilometres per hour, with the strongest winds in autumn (Eshragh, n.d., page 10 and Arseh Consultants, 1986, Vol. 1, page 51).

The environmental conditions of the city have influenced the design of new projects. In the 102-Hectare Project, the site is located adjacent to a heavy industrial zone and may be affected by pollution. Therefore, provision of a green space was considered important as a separation filter in order to minimise effects on the new residential area from the heavy industrial zone to the south. In the context of decision-making about density, consideration of the direction of the prevailing winds meant that a maximum of four-to six-storey buildings was recommended. The most easterly neighbourhood, which was closest to industrial zone, was designed to be low density, mostly one-storey houses. The far western neighbourhood was designed for highest density, mostly for six-storey buildings.

Another example of the impact of environment and climate on decision-making may be shown in the necessity to provide adequate roads. In large commercial centres
such as central business districts, appropriate density levels are usually related to the capacity of the streets and transport system to deal with the human mobility generated by buildings. However, in smaller residential areas, such as land development projects in the medium sized city of Arak, density levels should be designed in relation to the effects of pedestrian and vehicular movement. As noted above, Arak is confronted with a very cold climate and a long winter with heavy snows. If snow is left in narrow streets and alleys for a long period of time (see Plate 7.2 in Chapter Seven), it is likely to give rise to problems of transportation and people's movement. Therefore, in the design and implementation of roads, these climatic conditions need to be seriously considered. Providing asphalt streets and adequate drainage systems may be essential infrastructure elements required to alleviate the problems of transport.

A further impact of the environment on decision-making about density concerns the environmental conditions of built-up areas. The north part of the Gerdoo Project was designed to be low density because the existing built-up area of the city located next to the project was also low density. By contrast, the south of the Gerdoo Project was designed for high density with high rise buildings (Figure 8.3). Considering the cold weather in winter and the desirability of receiving the maximum benefit from sun light, the best direction for buildings in Gerdoo Project was between 20 degrees from the west to 45 degrees in the east (optimum was 12 degrees in the east). Therefore, it was considered that the best direction was between 27 degrees and 30 degrees to the east (Arseh Consultants, 1987:16). All these environmental considerations such as building directions applied in practice and builders had to consider them in implementation.
8.3 Response to housing and land needs

The need for residential land

There have been some statistics which might be misleading to an accurate estimation of the need for land. The most significant authority dealing with land issues is the Urban Land Organisation (ULO). Therefore, it might be considered one of the most reliable sources of data on land demand. By 1986, all families in the city of Arak with four or more persons had been allocated a piece of land from the ULO. Therefore, from that time, most applicants were those who had smaller households. The data available also show that in October 1988, 1,740 families were on the waiting list to obtain land from the ULO (Boad Technique Consultants, 1988:12). However, these figures alone are not adequate for estimating the need for housing and land in Arak. The ULO had several restrictive criteria for land allocation including: (1) applicants and their families must not possess any kind of housing or urban land anywhere in the urban areas of the country; (2) applicants must be married or over 25 years old; and (3) applicants must have spent a minimum of five years residing in the city. Therefore, there were many people who required housing and land but were not eligible to obtain land from the ULO.

Another indication of the inaccuracy of available data on the need for land can be found through examination of the industrial sector. As mentioned in previous chapters, industrialisation has been the most important factor in the recent growth and expansion of the city of Arak. When considering the limitations of the agricultural sector (water shortage and small agricultural productive units), the industrial sector gains in importance. For example, it was predicted that 38.5 per cent of population of the new town of Mohajeran (5,000 population) would work in the industrial sector and 61.8 per cent (8,000 population) in services and agriculture (HDSC, 1988, Vol. 1, page 65). Many attempts have been made to respond to the
housing needs of this sector as one the most important factors affecting the expansion of Arak. In 1986, the number of employees at nine major factories of the industrial zone who did not possess any house was 4,056 (the total number of employees was 8,632), over 50 per cent. These people were living with their relatives, resulting in the overcrowding which was discussed in the previous chapter (Arseh Consultants, 1989).

Thus, any estimation of land demand in Arak should be based on existing housing shortages, and figures for overcrowding and the growth of population and families. The total population increased from 265,349 in 1986 to 354,848 in 1991 with an annual growth rate of six per cent, while this had been estimated to reach a maximum population of 300,000 by 1991 and 400,000 by 2001. The average size of families was 4.7 persons in 1986. The number of families reached 68,826 in 1991 (with the increase of 13,738 families). In 1986, the total number of families of Arak was 55,088, while the number of housing units was 50,206 meaning there was a housing shortage in 1986 of 4,882 units. Therefore, the total increase in housing demand in the period 1986 to 1991 was 18,620 dwellings.

*Residential land supply*

In recent years, residential land in Arak has been supplied in three ways. The first and most important organisation responsible for land issue has been the provincial ULO. The second land supplier has been the Mohajeran new town. The third method of land supply has been via the private sector through the conversion of agricultural and other lands to residential uses. Nevertheless, since the revolution of 1979, and especially since 1985, the ULO and Mohajeran new town have been the most important organisations responsible for land supply. Therefore, the effects of the activities of these two organisations are considered here in detail.
Amongst four projects, the two most recent ones developed on sites adjacent to built-up areas were planned as high density projects and were consequently more effective in terms of land supply. Of the total dwellings in Gerdoo Project, 30 per cent were planned as one-storey houses, and 70 per cent as medium density to high rise buildings ranging from 4 to 12-storeys (Table 8.8). The final layout of the "102-Hectare Project" contained various types of dwellings ranging from large single houses to 6-storey apartment buildings. The site was divided into five different density zones. As can be seen in the Table 8.9, there was wide range of density patterns from very low density houses - average floor space of 187.5 square metres with 37.7 square metres per capita - to high density apartments with an average of 106.25 square metres of floor space or 15.6 square metres per capita.

### Table 8.8 Dwellings pattern in the Gerdoo Project

<table>
<thead>
<tr>
<th>Housing types</th>
<th>Number of residential blocks</th>
<th>Number of dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 storeys</td>
<td>493</td>
<td>1232</td>
</tr>
<tr>
<td>4 storeys</td>
<td>76</td>
<td>1824</td>
</tr>
<tr>
<td>6 storeys</td>
<td>8</td>
<td>384</td>
</tr>
<tr>
<td>8 storeys</td>
<td>6</td>
<td>384</td>
</tr>
<tr>
<td>12 storeys</td>
<td>6</td>
<td>720</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>589</strong></td>
<td><strong>4544</strong></td>
</tr>
</tbody>
</table>


### Table 8.9 Dwellings pattern in "102-Hectare Project"

<table>
<thead>
<tr>
<th>Housing types</th>
<th>Average Floor space (Sq.m.)</th>
<th>Per capita floor space (Sq.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large single houses</td>
<td>187.5</td>
<td>37.7</td>
</tr>
<tr>
<td>Small single houses</td>
<td>162.5</td>
<td>30.0</td>
</tr>
<tr>
<td>High density (4 storeys)</td>
<td>137.5</td>
<td>22.9</td>
</tr>
<tr>
<td>High rise buildings (6 storeys)</td>
<td>106.0</td>
<td>15.6</td>
</tr>
<tr>
<td>Mixed density</td>
<td>106.2</td>
<td>15.6</td>
</tr>
</tbody>
</table>


A comparison of the "70-Hectare Project" and the Gerdoo Project shows the differences between the amount of land supplied in different patterns of density.
These two projects had exactly same area of land but developed at different densities at different times. The "70-Hectare Project" was planned before the initiation of the new policy of 1985 to contain 2,200 one-storey houses. In contrast, the Gerdoo Project was planned as the highest density project in the city, with 4,544 dwelling units, over twice the number of dwellings in the "70-Hectare Project" (Plates 8.3 and 8.4). Therefore, in terms of land supply, the Gerdoo Project has been the most effective project in the city.

Plate 8.3 The Gerdoo Project (Winter season, 1993)
Medium density dwellings are under construction.
Source: Author.

The characteristics of the new town of Mohajeran were totally different from the above-mentioned projects, although they were all planned and developed in the same period. The new town of Mohajeran was planned to respond to the land demand created by the new industrial zone. The two major aims of this new town were first, providing residential areas near people's place of work and, second, the provision of homes for the surplus population of Arak. The total housing needs of the two major new industries -the oil refinery and petrochemical plants- was
Plate 8.4 A view of the Gerdoo Project in Arak (Autumn season, 1994)
A new medium and high density project under construction.
Source: Author.
estimated at 5,000 dwellings, and it was planned that 2,555 units would be constructed by 1991. These dwellings were designed as employer-provided housing to be managed by the industries. The number of families for the new town was estimated at 16,000. Out of this, 30 per cent were from the two major oil industries and the remaining 70 per cent were for the additional population of the city of Arak.

Table 8.10  Residential lot types in the first land development project in Mohajeran

<table>
<thead>
<tr>
<th>Type of lots</th>
<th>Number</th>
<th>No. of dwellings</th>
<th>%</th>
<th>Total area (Sq.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villa 250 Sq.m.</td>
<td>2,000</td>
<td>2,000</td>
<td>43.2</td>
<td>500,000</td>
</tr>
<tr>
<td>Villa 300 Sq.m.</td>
<td>2,500</td>
<td>2,500</td>
<td>54.0</td>
<td>750,000</td>
</tr>
<tr>
<td>Mixed (villa &amp; apartment)</td>
<td>125</td>
<td>500</td>
<td>2.8</td>
<td>37,500</td>
</tr>
<tr>
<td>Total residential area</td>
<td>4,625</td>
<td>5,000</td>
<td>100.0</td>
<td>1,287,500</td>
</tr>
</tbody>
</table>


The major argument concerning land supply in this new town is related to site selection and the pattern of development. One of the issues considered in the development of the new town was the need to attract residents from Arak to this new site. Because of this, its density was the lowest of all new projects. Of the total number of dwellings allocated to oil industry employees, 90 per cent were villas (one-storey houses) and 10 per cent were apartments. The first stage was the development of 128 hectares of land with a very low density pattern, as Table 8.10 shows. As noted above, this project was planned specifically for the two major heavy industries. Nevertheless, this pattern of low density may give rise to other problems such as higher costs of infrastructure. This was argued in the density decision discussed above and also will be argued in the next section under infrastructure provision. Overall, the MHUD's land supply program proposed 14,061 units through the implementation of new land development projects within the city and 2,555 units through the Mohajeran new town to be built during 1986-1991 (Table 8.11). Table 8.12 compares land demand and land supply in Arak during the period of 1985 to 1991.
Table 8.11 Proposed housing supply by land development projects in Arak, 1985-1991

<table>
<thead>
<tr>
<th>Projects</th>
<th>Villa</th>
<th>Apartment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;70-Hectare Project&quot;</td>
<td>2,200</td>
<td>0</td>
<td>2,200</td>
</tr>
<tr>
<td>Gerdoo Project</td>
<td>430</td>
<td>4,114</td>
<td>4,544</td>
</tr>
<tr>
<td>&quot;102-Hectare Project&quot;</td>
<td>5,500</td>
<td></td>
<td>5,500</td>
</tr>
<tr>
<td>Shomal Gharb</td>
<td>692 (two stories)</td>
<td>692</td>
<td></td>
</tr>
<tr>
<td>Shomal Shargh</td>
<td>1,025</td>
<td></td>
<td>1,025</td>
</tr>
<tr>
<td>Sorekan</td>
<td>100</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Mohajeran new town</td>
<td>2,555</td>
<td></td>
<td>2,555</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>16,616</td>
</tr>
</tbody>
</table>

Source: Author's calculations based on data from the ULO, 1992c and MCDC, 1992.

Table 8.12 Land needs and supply in Arak, 1986-1991

<table>
<thead>
<tr>
<th>Needs</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households increase, 1986-1991</td>
<td>By the ULO 14,061</td>
</tr>
<tr>
<td>Shortage in 1986</td>
<td>By the new city 2,555</td>
</tr>
<tr>
<td></td>
<td>By private sector *</td>
</tr>
<tr>
<td><strong>Total needs</strong></td>
<td><strong>16,616</strong></td>
</tr>
</tbody>
</table>

* No data available. ** Without private sector.

The fluctuating trend of land supply has been similar to that of the whole country as shown in Chapter Five of this study. As argued in that chapter, one of the immediate impacts of the new land development policy on housing provision was a decrease in land distribution in the initial years because of the requirement to include provision of infrastructure. In 1984, the year before the implementation of the new policy, the amount of land distributed by the provincial ULO in Arak was at its historical maximum amounting to 1,350 dwellings. However, after the implementation of the new policy it decreased to a minimum in 1988 of 545 dwellings. When land was provided with associated infrastructure, including roads, drainage system and electricity in new projects, the provincial office of the ULO began to distribute lots...
among applicants. Since the development and distribution of land in these projects was undertaken in almost the same period (Table 8.1), the number of families receiving land from the ULO reached its peak level of 2,842 families in 1990 (Figure 8.5).

Figure 8.5 Number of families that received land from the ULO in Arak, 1982-1990*

* No data available for 1989.

Housing provision

The successful provision of land should not imply that housing production increased at the same rate as land supply. The statistics reveal that the ULO's supply of land met approximately 90 per cent of total land demand in Arak. Furthermore, as noted earlier, the private sector has also supplemented the supply of land. However, there has been a substantial difference between the amount of land provided by the ULO and the number of construction permits issued by the council. While the average number of approved housing applications issued by the municipal council was annually 3,200 during 1976-1986, it dropped to 1,550 in 1986. The amount of land distributed by the ULO in 1990 was for 2,842 units (34.3 hectares) while the
The number of residential construction permits issued by the council was 1,983 units (23.7 hectares) (Markazi PBO, 1992c:326). This phenomenon appears across the whole country. For example, in 1991, 160,000 lots for dwelling units were allocated in new land development projects and new cities. However, the total construction permits issued by municipalities amounted to only 140,000 units.

Three reasons can be suggested for this gap between the amount of land supply and the number of constructed dwellings. The first concerns the process of land allocation by the ULO. As noted in Chapters Five and Six, there were criteria for selection of eligible applicants. Even if land was prepared for allocation and delivered to applicants, the ULO had control over the eligibility of applicants, which usually took some time to establish. The second reason, perhaps the most important reason in Arak, was the changes in decision-making about density for recent projects. Where dwellings were designed as high density apartment types, the ULO could not allocate them to individual applicants. Instead, the dwellings had to be allocated through housing co-operatives or institutions. This change in planning strategy caused delays in land allocation, and subsequently housing provision.

Another reason for the considerable time lag between the supply of suitable land and the provision of housing is the administrative processes associated with obtaining building permits from the municipal council. After the ULO delivered the land, the applicants were obliged to proceed to the council to obtain permission for construction. Documents such as the blue print (floor plan) had to be presented and an authorised architect nominated as the construction supervisor was necessary. After land inspection by the council inspectors and other administrative processes, the permit was given to applicants. This process could stretch out over several months.

A further issue in the context of housing construction concerns the extent of investment by the private sector which has caused a fluctuating trend. Over the last
two decades, governmental investment in housing for the whole country decreased from 24 per cent in 1974 to 1.9 per cent in 1987 (Table 8.13). The high investment levels in 1974 are clearly attributable to the oil price boom in 1973. The only exception to the trend of increasing private sector investment in housing occurred around 1982 when the share of the private sector dropped to 84.5 per cent. Among the reasons suggested for this decrease, the two most important ones were first, the lack of private sector confidence for investment on housing (sale and rent); and second, a dramatic increase in material costs. The index of this indicator was 100 in 1982, and increased to 121.4 in 1985, 306 in 1989 and 514.9 in 1990 (MHUD, 1991d:9).

Table 8.13 The proportion of public and private investments on housing (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>1974</th>
<th>1979</th>
<th>1982</th>
<th>1987</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>24.0</td>
<td>8.7</td>
<td>15.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Private sector</td>
<td>76.0</td>
<td>91.3</td>
<td>84.5</td>
<td>98.1</td>
</tr>
</tbody>
</table>


8.4 Response to infrastructure needs

Provision of basic infrastructure

Prior to the implementation of the new land development policy, various departments had responsibilities for the provision of infrastructure items in new residential areas in Arak. As noted previously, provision of infrastructure refers to basic infrastructure items including roads, water supply, sewerage systems, drainage systems and electricity. The municipality was responsible for the provision of roads and drainage systems, the water board for water supply, and the electricity board for electricity provision. Prior to the new land development policy of 1985, the provision of basic infrastructure in new residential areas lagged behind housing construction because of several problems discussed in Chapter Seven. The
departments responsible for each item usually provided infrastructure based on the demand from applicants after residents were already accommodated in new housing, and often waited until the number of applicants made provision of infrastructure economical.

However, under the new policy, the organisation of the provision of infrastructure was restructured and different agencies and bodies have been involved in the implementation process. The costs of all infrastructure items were estimated for projects in the process of plan preparation by consultants. By using funds gained through the user-pays system, the effectiveness of which will be assessed later in this chapter, roads, drainage and sewerage systems were provided through contractual agreements between the MHUD and private companies. For water reticulation (pipes) and power supply, too, separate agreements were made between the MHUD and responsible governmental bodies. Therefore, the MHUD acquired official responsibility for the provision of infrastructure and responding to residents' needs.

Location and associated physiographical conditions of the projects were important factors in the efficiency of infrastructure provision. The differences between two major land development projects, Gerdoo Project and "102-Hectare Project," emerged strongly in the extent of the effectiveness of implementation. As Tables 8.14 and 8.15 show there were substantial differences in the costs of infrastructure for these two projects. For the "102-Hectare Project", which was located near the city's existing built-up area and with few physical difficulties, the water board of the city announced that there were enough water resources, whereas a similar announcement was not made for the Gerdoo Project. The "102-Hectare Project" was a flat site with a one per cent slope, which implies minimal costs of infrastructure and easy development of a water network. It was also located adjacent to the built-up area of the city, with a consequent reduction of costs including transport (delivery) line.
Plate 8.5 The "102-Hectare Project" Arak (Autumn season, 1994)
Developed under the urban land development policy of 1985. In the first stage (left), basic infrastructure provided and housing has been constructed. In the second stage (right), infrastructure provision is under construction.
Source: Author.

Plate 8.6 The "102-Hectare Project" Arak (Autumn season, 1994)
A view of the process of infrastructure implementation.
Source: Author.
Table 8.14 Infrastructure costs in the 102-Hectare Project

<table>
<thead>
<tr>
<th>Services</th>
<th>Costs (millions Rials)</th>
<th>Per capita (Rials)</th>
<th>Rials per square metre land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply*</td>
<td>284</td>
<td>15,100</td>
<td>280</td>
</tr>
<tr>
<td>Sewerage systems</td>
<td>256</td>
<td>13,617</td>
<td>252</td>
</tr>
<tr>
<td>Drainage systems</td>
<td>339</td>
<td>18,021</td>
<td>333</td>
</tr>
<tr>
<td>Roads</td>
<td>626</td>
<td>33,322</td>
<td>616</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,505</strong></td>
<td><strong>80,060</strong></td>
<td><strong>1,481</strong></td>
</tr>
</tbody>
</table>

* The estimation of expenditure for water was only for reticulation and reservoirs.
Source: Arseh Consultants, 1989:56.

Table 8.15 Actual infrastructure costs in Gerdoo Project

<table>
<thead>
<tr>
<th>Services</th>
<th>Total costs (million Rials)</th>
<th>Per capita (Rials)</th>
<th>Per square metre land (Rials)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>365.3</td>
<td>17,000</td>
<td>462</td>
</tr>
<tr>
<td>Sewerage and drainage</td>
<td>299.6</td>
<td>13,620</td>
<td>380</td>
</tr>
<tr>
<td>Roads</td>
<td>504.1</td>
<td>23,400</td>
<td>638</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,169.0</strong></td>
<td><strong>54,020</strong></td>
<td><strong>1480</strong></td>
</tr>
</tbody>
</table>


The Gerdoo Project demonstrates a high level of infrastructure costs. Drainage and flood mitigation costs were anticipated to be high. It was estimated that the site would need two wells, each producing 40 litres of water per second. The costs of water supply included the following items: two wells with their equipment, a reservoir with a capacity of 6,500 cubic metres, a transfer line from wells to reservoirs, filtering of water and refining machines, a transfer line from reservoir to site, and a reticulation network on the site (Arseh Consultants, 1987:60).

These locational and physical conditions of the site affected the process of water supply. While the city's water board had announced that water could be provided for a population of up to 400,000 people, then it found that it could not respond to new projects based on this estimate. By the time of the beginning of the implementation of Gerdoo Project, the water board announced that it could not provide water within...
ten years nor probably twenty years time. The water board announced that it could not extend the city's reticulation to the site, and that water for the site should be provided through the digging of separate wells within the site. Nevertheless, despite higher costs of the development of this site, the MHUD proceeded with the project for the reasons already discussed including the housing pressure and limited availability of land in Arak.

Apart from the location and physical condition of sites discussed above, the increase in per capita water consumption in new residential areas is a significant factor to be considered. In 1986, the daily water consumption in built up areas of the city was between 150-200 litres per person. This amount was predicted to increase to 250-300 litres in new areas for three reasons. Firstly, many residents in unplanned areas were rural-urban migrants who had low levels of consumption. Secondly, with improvements in life style and health, their consumption would increase. Thirdly, at that time, the city experienced a water shortage and if this problem was solved, consumption would be likely to increase. These figures indicate that water supply is a major concern in Arak in the future. Nevertheless, by 1994 water was supplied for all new land development projects in Arak.

It can be argued that the most successful infrastructure items provided in almost all areas were roads, drainage systems and electricity. As can be seen in Tables 8.14 and 8.15, roads have been the most expensive items amongst all infrastructure elements. As noted above, roads and drainage systems were provided mostly through agreements between the provincial office of MHUD and private companies. For water and electricity, too, similar agreements took place between the office and water and electricity boards. If the MHUD obtained enough funds from applicants, the companies and the boards were able to provide relevant infrastructure

1 Field observation, October 1994.
successfully. As will be indicated in the following section, the user-pays system worked successfully in Arak. Therefore, there were few financial limitations in the provision of these infrastructures.

The provision of sewerage systems, however, has been the most important problem. Reflecting the nationwide concern for environmental quality (according to the author's knowledge from working in the MHUD), there was a strong and increasing concern about the need for sewerage provision and sewage treatment in all new land development projects. Therefore, for the new land development projects of Arak, it was proposed that sewerage systems were to be implemented and their projected costs included in the total costs of projects (Tables 8.14 and 8.15). However, there have been two limitations in the provision of this item. Firstly, as noted in the previous chapter, there is no sewerage system in the city of Arak. Apart from a few planned projects such as the Industrial Town using septic tanks, all waste water and disposal are discharged underground through wells. As such, the waste water of new projects had to be disposed through local septic tanks, consequently increasing the costs. The second problem concerned the maintenance of the desired type of sewerage systems. As such systems require relatively highly skilled personnel, they could not work efficiently while the city has already had skilled personnel problem, as indicated in previous chapter.

In the process of development of the Mohajeran new town, neither direct users nor the local council played any role. Instead, the two major industries, oil and petrochemical plants, provided funds for the initial stages of development through obtaining plots from the new town corporation. From 1988 to 1993, some items of infrastructure and public facilities were provided. The overall progress in road construction was improved by 30 per cent by the end of 1992. This varied in different neighbourhoods, ranging from 11.5 per cent to 100 per cent (MCDC, 1992). The most important factor causing relatively rapid development of this town was the financial contribution of industries. Instead of the problem of fee collection,
which has been one of the most important limitations of the user-pays system causing delays in implementation, the new town corporation obtained funding from only two industrial bodies.

Results of user-pays system in Arak

Financial management represents one of the primary tasks of the development of new areas. Like other projects across the country, all new land development projects in Arak have been financed through the user-pays system. However, the development of the Mohajeran new town did not operate under the new urban land development policy. The project was carried out by an independent institution - Mohajeran New City Corporation- which owned the land. Therefore, the user-pays system did not apply to the new town, and consequently it is not considered in this analysis.

Table 8.16 The Results of user-pays system in Arak by 1992 (millions Rials)

<table>
<thead>
<tr>
<th>Projects</th>
<th>Area(h)</th>
<th>year commenced</th>
<th>Expenditures</th>
<th>User-payments</th>
<th>Balance</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;70 Hectare&quot;</td>
<td>70</td>
<td>1985</td>
<td>885.4</td>
<td>1100.2</td>
<td>214.8</td>
<td>1.24</td>
</tr>
<tr>
<td>Gerdoo</td>
<td>70</td>
<td>1985</td>
<td>794.7</td>
<td>540.9</td>
<td>-253.8</td>
<td>0.68</td>
</tr>
<tr>
<td>Shomal Gharb</td>
<td>16</td>
<td>1987</td>
<td>217.4</td>
<td>318.7</td>
<td>101.3</td>
<td>1.46</td>
</tr>
<tr>
<td>&quot;102-Hectare&quot;</td>
<td>102</td>
<td>1987</td>
<td>31.5</td>
<td>0.0</td>
<td>-31.5</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1929.0</strong></td>
<td><strong>1959.8</strong></td>
<td><strong>30.8</strong></td>
<td><strong>1.01</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Calculated from ULO, 1992c.

Until 1993, the overall balance of projects implemented in Arak was positive and the overall ratio (the proportion of user-payments to governmental expenditure) was 1.01 (Table 8.16). However, of the four projects developed in Arak, two had positive balances and two had negative balances. The "70-Hectare" and Shomal Gharb Projects had successful records of user-payments while the two other projects, the Gerdoo and "102-Hectare" Projects, had user payments problems. It should be noted that these figures refer to 1992 statistics in which all projects of the
country were analysed in Chapter Five. The most recent statistics of 1994 have been analysed later in this section in which the impact of inflation has also been considered.

Figure 8.6 Expenditures, user-payments, and balance in Arak projects up to 1992

* The performance of the "102-Hectare" project was affected by a variety of unusual circumstances which is explained in the text.

Source: Prepared by the author according to Table 8.16.

Three issues can be raised in the context of the effectiveness of the user-pays system in Arak. The first issue was the pattern of land use and the process of fee collection. One of the factors affecting positive balances in the "70-Hectare" and Shomal Gharb projects was the pattern of low density housing. As noted above, the majority of lots in these two projects were single houses/villas. The "70-Hectare Project" was planned entirely as low density housing and its lots were designed as one-story houses. Fee collection in this pattern was a major task for the ULO because of the large number of users. However, this pattern of land use was the most appropriate pattern from the point of view of users as it has been the traditional pattern of housing in Iranian cities. Consequently, users have paid the infrastructure costs willingly, particularly, while land for applicants was at a very low price in comparison with the free market price. Furthermore, the ULO could allocate lots to individuals from the time of planning, even before implementation, and obtain funds.
Even in 1994, the provincial MHUD returned 50 per cent of collected funds to applicants as surplus. This amounted \( \frac{6,000}{12,000} \) Rials per square metre land out of collected 12,000 Rials. However, in a high density pattern such as the Gerdoo Project, as will be shown below, applicants were unknown to the ULO and it had to obtain funds from the institutions or cooperatives which may cause delays in fee collection.

The Gerdoo and "102-Hectare" projects were confronted with user payments problems in the initial years. The change in the project density in Gerdoo - from a low density to a higher density with high rise buildings (up to 12-storey residential buildings) - affected the process of land allocation. It became difficult to allocate high density residential lots to individuals and, consequently, obtaining funds from applicants became an important issue. The performance of the "102-Hectare Project" was affected by a variety of unusual circumstances. The user-payments in this project were zero because of changes in the process of implementation. Though initially planned to be implemented in ways similar to other projects for the reasons noted above, it was decided that it should be implemented by the governmental organisation Sherkat-e Sarmayeh Gozari-e Bank-e Maskan. This organisation was to construct all dwellings and provide all infrastructure. Because of this arrangement, costs of infrastructure were not paid to the ULO, consequently, showing zero user-payments. The small amount of expenditure by the MHUD was related to the design process which had been paid to consultants.

The second issue affecting the costs of infrastructure provision and, consequently, user-payments was the physical condition of various projects. The balance of the Gerdoo Project was the lowest of all the projects implemented in the city. This may

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2 Based on interviews with the provincial MHUD officials in Arak and field observation, October 1994.
be attributed to the relatively higher costs of this project as indicated above. The location and physiography of the site was the most difficult among all new land development projects in Arak. It required that special attention be paid to flooding and drainage systems. In addition, development of access roads from the city to the site increased the cost of the project.

Annual data on expenditure and user-payments for three projects including the Gerdoo, "102-Hectare" and "16-Hectare" projects, collected through a questionnaire distributed to the provincial MHUD offices in Arak in October 1994, were examined in detail. One of the issues was the examination of the impact of inflation on user-payments. While the amount of expenditure and user-payments was different in various years, inflation also affected the results. Therefore, similar to the sample projects examined in Chapter Five, the impact of inflation upon the implementation of policy was considered in the case study area. As noted in Chapter Five, the annual rate of inflation was 13.5 per cent per year between 1980-1990. Nominal expenditures and user-payments for these projects were transferred into real statistics. As can be seen in Tables 8.17 to 8.22, the results changed.

The most important result of this analysis is the difference between balance and ratio in the Gerdoo Project and "70-Hectare Project". This caused a significant increase in the total balance and ratio in the "70-Hectare Project" in which the balance increased dramatically from -82.3 million Rials to +304.3 million Rials. The balance of this project from the early years was positive (Table 8.20). The reason for this can be attributed to the low density of the project for which applicants paid willingly. In contrast, the balance in the Gerdoo project decreased dramatically from 71.9 million Rials to 12.6 million Rials. It is notable that the user-payments was zero in the three first years of its implementation (Table 8.17). Figures 8.7 and 8.8 shows the trends of real expenditure and real user-payments in these two projects.
Several reasons contributed towards the low balance in the Gerdoo Project. First, as mentioned earlier, the project was disadvantaged by its physical condition and location (topography and difficult access to site), which increased expenditure. Secondly, the institutional framework for this project was different from that in the "70-Hectare Project". Most residential plots were allocated to co-operatives, consequently difficulties in fee collection existed. Thirdly, this project was one of the high density projects in the city, decreasing its popularity.

The third project was the “16- Hectare Project”. As can be seen in the Tables 8.21 and 8.22, the project ran at a loss for the first four years of implementation. In the end the project balance became positive because all development activities were finished and applicants had to pay their shares for transferring the title of the land.

Table 8.17  Nominal and real expenditure and user payments in the Gerdoo Project, 1987-1993 (Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Expenditure</th>
<th>Real Expenditure</th>
<th>Nominal User Payments</th>
<th>Real User Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>4.2</td>
<td>30.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1988</td>
<td>2.2</td>
<td>4.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>178.5</td>
<td>296.2</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1990</td>
<td>45.4</td>
<td>66.4</td>
<td>222.7</td>
<td>325.6</td>
</tr>
<tr>
<td>1991</td>
<td>344.6</td>
<td>443.9</td>
<td>230.5</td>
<td>296.9</td>
</tr>
<tr>
<td>1992</td>
<td>82.6</td>
<td>93.7</td>
<td>110.9</td>
<td>125.9</td>
</tr>
<tr>
<td>1993</td>
<td>64.9</td>
<td>73.7</td>
<td>240.2</td>
<td>272.6</td>
</tr>
<tr>
<td>Total</td>
<td>732.4</td>
<td>1008.4</td>
<td>804.3</td>
<td>1021.1</td>
</tr>
</tbody>
</table>

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.

Table 8.18  Nominal and real balance and ratio in the Gerdoo Project, 1987-1993 (Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal balance</th>
<th>Real balance</th>
<th>Nominal ratio</th>
<th>Real ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>-14.2</td>
<td>-30.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1988</td>
<td>-2.2</td>
<td>-4.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>-178.5</td>
<td>-296.2</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1990</td>
<td>177.3</td>
<td>259.2</td>
<td>4.91</td>
<td>4.90</td>
</tr>
<tr>
<td>1991</td>
<td>-114.1</td>
<td>-146.9</td>
<td>0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>1992</td>
<td>28.3</td>
<td>32.1</td>
<td>1.34</td>
<td>1.34</td>
</tr>
<tr>
<td>1993</td>
<td>175.3</td>
<td>198.9</td>
<td>3.70</td>
<td>3.70</td>
</tr>
<tr>
<td>Total</td>
<td>71.9</td>
<td>12.6</td>
<td>1.10</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.
Table 8.19  Nominal and real expenditure and user payments in the 70-Hectare Project (*Shahrak-e Ghods*), 1988-1993 (Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Expenditure</th>
<th>Real Expenditure</th>
<th>Nominal User Payments</th>
<th>Real User Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>14.3</td>
<td>26.9</td>
<td>195.9</td>
<td>369.0</td>
</tr>
<tr>
<td>1989</td>
<td>40.6</td>
<td>67.4</td>
<td>426.8</td>
<td>708.3</td>
</tr>
<tr>
<td>1990</td>
<td>17.5</td>
<td>25.6</td>
<td>202.1</td>
<td>295.5</td>
</tr>
<tr>
<td>1991</td>
<td>63.4</td>
<td>81.7</td>
<td>55.5</td>
<td>71.5</td>
</tr>
<tr>
<td>1992</td>
<td>678.6</td>
<td>770.2</td>
<td>225.2</td>
<td>255.6</td>
</tr>
<tr>
<td>1993</td>
<td>582.3</td>
<td>660.9</td>
<td>208.9</td>
<td>237.1</td>
</tr>
<tr>
<td>Total</td>
<td>1396.7</td>
<td>1632.7</td>
<td>1314.4</td>
<td>1937.0</td>
</tr>
</tbody>
</table>

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.

Table 8.20  Nominal and real balance and ratio in the 70-Hectare Project (*Shahrak-e Ghods*), 1988-1993 (Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Balance</th>
<th>Real Balance</th>
<th>Nominal Ratio</th>
<th>Real Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>181.6</td>
<td>342.1</td>
<td>13.70</td>
<td>13.71</td>
</tr>
<tr>
<td>1989</td>
<td>386.2</td>
<td>640.9</td>
<td>10.51</td>
<td>10.51</td>
</tr>
<tr>
<td>1990</td>
<td>184.6</td>
<td>269.9</td>
<td>11.55</td>
<td>11.54</td>
</tr>
<tr>
<td>1991</td>
<td>-7.9</td>
<td>-10.2</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td>1992</td>
<td>-453.4</td>
<td>-514.6</td>
<td>0.33</td>
<td>0.33</td>
</tr>
<tr>
<td>1993</td>
<td>-373.4</td>
<td>-423.8</td>
<td>0.36</td>
<td>0.36</td>
</tr>
<tr>
<td>Total</td>
<td>-82.3</td>
<td>304.3</td>
<td>0.94</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.

Table 8.21  Nominal and real expenditure and user payments in the "16-Hectare Project", 1987-1993 (Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Expenditure</th>
<th>Real Expenditure</th>
<th>Nominal User Payment</th>
<th>Real User Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>0.3</td>
<td>0.6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1988</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>5.7</td>
<td>9.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1990</td>
<td>74.6</td>
<td>109.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1991</td>
<td>150.5</td>
<td>193.9</td>
<td>222.2</td>
<td>286.2</td>
</tr>
<tr>
<td>1992</td>
<td>11.5</td>
<td>13.1</td>
<td>95.1</td>
<td>107.9</td>
</tr>
<tr>
<td>1993</td>
<td>39.8</td>
<td>39.8</td>
<td>48.9</td>
<td>48.9</td>
</tr>
<tr>
<td>Total</td>
<td>282.4</td>
<td>365.9</td>
<td>366.2</td>
<td>443.1</td>
</tr>
</tbody>
</table>

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.
Table 8.22  Nominal and real balance and ratio in the 16-Hectare Project, 1987-1993

(Million Rials)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Balance</th>
<th>Real Balance</th>
<th>Nominal Ratio</th>
<th>Real Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>-0.3</td>
<td>-0.6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1988</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>-5.7</td>
<td>-9.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1990</td>
<td>-74.6</td>
<td>-109.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1991</td>
<td>71.7</td>
<td>92.4</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>1992</td>
<td>83.6</td>
<td>94.9</td>
<td>8.3</td>
<td>8.2</td>
</tr>
<tr>
<td>1993</td>
<td>9.1</td>
<td>9.1</td>
<td>1.2</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Total 83.8 77.2 1.3 1.2

Source: Field survey. Data from the questionnaire distributed to the provincial MHUD and ULO offices in Arak, October 1994.

Figure 8.7 Trends in real expenditures and user-payments in the 70-Hectare Project, 1988-1993

Source: Field survey, 1994. Data from the provincial MHUD and ULO offices in Arak.

Figure 8.8 Trends in real expenditures and user-payments in the Gerdoo Project, 1987-1993

Source: Field survey, 1994. Data from the provincial MHUD and ULO offices in Arak.
Affordability

Arak is located in a relatively developed region of the country and this study assumed that people could afford to pay the costs of infrastructure. Family income data for 1985, the first year of the implementation of the new policy, support this conclusion. Among the total urban families in Markazi province, 31.2 per cent were in low-income groups\(^3\), 65.9 per cent had middle incomes and 3.9 per cent were in high income groups. As Table 8.23 shows, the middle income group was the largest with a total higher than that for the country as a whole. Similarly, those with middle incomes comprised the largest group of government land applicants during the initial years of the implementation of the new policy. Table 8.24 indicates that residents with less than 50,000 Rials found the largest group in the whole city. However, Table 8.25 shows that those with low incomes comprised less than 10 per cent, placing the majority of applicants in the middle income group. One reason for

\(^3\)Low income groups were defined as families in which incomes were less than living expenses. Middle income groups were those for whom incomes were almost the same as their expenditures and higher income groups were those for whom incomes were higher than expenditure, consequently they could save and well afford housing costs (Hamoon Consultants, 1990c:35).
the high percentage of middle income groups among the land applicants related to land allocation regulations. These determined that land applicants must be able to afford to build housing using their own savings and borrowings from banks.

Table 8.23  Comparison between financial status of families of Markazi province and Iran, (percentage, 1985)

<table>
<thead>
<tr>
<th></th>
<th>Less than 600,001 Rials per year</th>
<th>600,001-1,800,000 Rials per year</th>
<th>1,800,001 Rials or more per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>32.09</td>
<td>58.32</td>
<td>9.58</td>
</tr>
<tr>
<td>Markazi Province</td>
<td>31.19</td>
<td>65.96</td>
<td>3.85</td>
</tr>
</tbody>
</table>

Source: Adopted from Hamoon Consultants, 1990c:35.

Table 8.24  Income distribution comparisons in Arak in 1986

<table>
<thead>
<tr>
<th>Monthly family income (Rials)</th>
<th>% in the whole city</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 50,000</td>
<td>44</td>
</tr>
<tr>
<td>50,001-70,000</td>
<td>42</td>
</tr>
<tr>
<td>70,001-100,000</td>
<td>10</td>
</tr>
<tr>
<td>100,001 or more</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Arseh Consultants, 1989:34.

Table 8.25  Financial status of land applicants in Arak in 1986

<table>
<thead>
<tr>
<th>Income groups</th>
<th>Monthly income (Rials)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>up to 30,000</td>
<td>9.22</td>
</tr>
<tr>
<td>2</td>
<td>30,001-39,960</td>
<td>11.60</td>
</tr>
<tr>
<td>3</td>
<td>39,961-49,980</td>
<td>19.43</td>
</tr>
<tr>
<td>4</td>
<td>49,981-60,000</td>
<td>25.27</td>
</tr>
<tr>
<td>5</td>
<td>60,001-69,990</td>
<td>17.28</td>
</tr>
<tr>
<td>6</td>
<td>69,991-79,980</td>
<td>6.36</td>
</tr>
<tr>
<td>7</td>
<td>79,981-90,000</td>
<td>4.19</td>
</tr>
<tr>
<td>8</td>
<td>90,001-100,000</td>
<td>3.09</td>
</tr>
<tr>
<td>9</td>
<td>100,001+</td>
<td>3.56</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Arseh Consultants, 1990:3.
An important effect of the implementation of the new policy can be measured in terms of land and housing prices. The data available for the urban population of the whole country shows that in 1989 only 25 per cent could afford to purchase land in the free market. However, as a result of the completion of many new land development projects and allocation of plots, this proportion increased to 51.2 per cent in 1992 (ULO, 1992d:20-22). The main reason for this lies in the increase in residential land supply through the new land development policy. As discussed in Chapter Five (Figure 5.9), the distribution of developed land was at a minimum during 1988 and 1989 because of the requirement that infrastructure be provided before land be allocated. However, since 1990, the amount of land supplied dramatically increased and, as a consequent decrease in the free market price. Consequently, the number of people who could afford to purchase land in the free market increased.

Affordability can also be measured through a comparison of land costs and housing prices. In 1976, housing expenditure was 24.7 per cent of monthly income for the urban population (after food costs amounting to 30.0 per cent). In 1986, it increased steadily to 25.04 per cent, despite the immense population growth (BMI, 1978:77 and 1987:17). In Arak, the most important reason that may be suggested as a factor influencing the viability of the user-pays system was the small proportion of the costs of land and infrastructure to overall housing costs. Before the implementation of post-revolutionary land policies, land costs covered over 40 per cent of housing construction in the free market in most urban areas. However, in Arak, in 1986, the government land price was much lower than the free market price (the proportion of land price to total housing construction in the free market in Arak was 35 per cent in 1986) (Arseh Consultants, 1989:29). However, the proportion of government land and infrastructure costs was less than 18 per cent for all groups and less than 10 per cent for the low income groups (Table 8.26).
Table 8.26  Relationship between income and housing expenditure in Arak, 1986

<table>
<thead>
<tr>
<th>Income groups</th>
<th>Monthly Income (Rials)</th>
<th>Floor space (Sq.m.)</th>
<th>Land price and infrastructure cost (Rials)</th>
<th>Total house price (Rials)</th>
<th>Proportion of land and infrastructure costs to house price (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>up to 30,000</td>
<td>81</td>
<td>288,000</td>
<td>3,528,000</td>
<td>8.16</td>
</tr>
<tr>
<td>2</td>
<td>30,001-39,960</td>
<td>89</td>
<td>336,000</td>
<td>3,896,000</td>
<td>8.62</td>
</tr>
<tr>
<td>3</td>
<td>39,961-49,980</td>
<td>97</td>
<td>384,000</td>
<td>4,264,000</td>
<td>9.00</td>
</tr>
<tr>
<td>4</td>
<td>49,981-60,000</td>
<td>105</td>
<td>432,000</td>
<td>4,632,000</td>
<td>9.32</td>
</tr>
<tr>
<td>5</td>
<td>60,001-69,990</td>
<td>112</td>
<td>480,000</td>
<td>4,960,000</td>
<td>9.68</td>
</tr>
<tr>
<td>6</td>
<td>69,991-79,980</td>
<td>119</td>
<td>600,000</td>
<td>5,360,000</td>
<td>11.19</td>
</tr>
<tr>
<td>7</td>
<td>79,981-90,000</td>
<td>125</td>
<td>750,000</td>
<td>5,750,000</td>
<td>13.04</td>
</tr>
<tr>
<td>8</td>
<td>90,001-100,000</td>
<td>130</td>
<td>940,000</td>
<td>6,140,000</td>
<td>15.30</td>
</tr>
<tr>
<td>9</td>
<td>100,001+</td>
<td>134</td>
<td>1,172,000</td>
<td>6,530,000</td>
<td>17.90</td>
</tr>
</tbody>
</table>

Source: Adopted from Arseh Consultants, 1989:82.

In spite of the fact that Arak was one of the cities where both land and housing prices increased, the rate of increase of land prices was less than that of the housing prices. Housing prices increased by 4.2 per cent between 1991 and 1992, while land prices increased by only 2.3 per cent (Table 8.27). In 1992, the average price of housing in Arak was 200,000 Rials per square metre and the average monthly rental for a house of 100 square metres in 1991 was 103,000 Rials, which is much higher than the average costs of land and infrastructure (MHUD, 1992j, pp. 2-4). In other words, it is not surprising that most new residents have accepted and supported the user-pays system. Nevertheless, in new projects such as Gerdoo, it was estimated that 40 per cent of total applicants had to spend all their incomes on just the land. Therefore, other resources were used for housing construction, including borrowing from banks and the mortgage system, government subsidies and housing production by government through social housing (see Arseh Consultants, 1989:7-8).

---

4 No more data available.
Table 8.27 Land and housing price increases in medium sized cities in Iran in 1992 compared to previous year

<table>
<thead>
<tr>
<th>Cities</th>
<th>Per square metre land price increase (%)</th>
<th>Per square metre housing price increase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qom</td>
<td>-2.8</td>
<td>-5.7</td>
</tr>
<tr>
<td>Ahvaz</td>
<td>5.0</td>
<td>9.3</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>-7.1</td>
<td>-10.5</td>
</tr>
<tr>
<td>Zahedan</td>
<td>-14.6</td>
<td>-15.8</td>
</tr>
<tr>
<td>Orumiyeh</td>
<td>3.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Hamadan</td>
<td>2.5</td>
<td>-4.7</td>
</tr>
<tr>
<td>Rasht</td>
<td>21.0</td>
<td>23.2</td>
</tr>
<tr>
<td>Arak</td>
<td>2.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Kerman</td>
<td>1.9</td>
<td>-6.0</td>
</tr>
<tr>
<td>Ardabil</td>
<td>27.2</td>
<td>23.0</td>
</tr>
<tr>
<td>Yazd</td>
<td>8.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Qazvin</td>
<td>0.0</td>
<td>-3.3</td>
</tr>
<tr>
<td>Dezful</td>
<td>10.4</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Source: Adopted from MHUD, 1992, pp. 4 and 9.

The planned distribution pattern of income groups for the Mohajeran new town was found to be different from the projects located in inner city areas. As noted above, the initial population of the new town was primarily designed for industrial employees. Furthermore, some employees would come from outside Arak (mainly Tehran), such as professional experts. Table 8.28 shows that the majority of residents in the town had middle incomes between 50,000 to 100,000 Rials per month. In addition, the proportion of low income groups with less than 50,000 Rials per month was only 30 per cent, while this group in the city comprised 42.2 per cent of the population.

Table 8.28 Estimate of income distribution in Mohajeran new town (1985 currency)

<table>
<thead>
<tr>
<th>Income groups</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income (up to 50,000 Rials)</td>
<td>30</td>
</tr>
<tr>
<td>Middle income (50,000-100,000 Rials)</td>
<td>55</td>
</tr>
<tr>
<td>High income (over 100,000 Rials)</td>
<td>15</td>
</tr>
</tbody>
</table>

Therefore, residents coming to live in the new town were more likely to be able to afford housing than those in Arak. Based on these figures, the majority of dwellings proposed for this new town had large floor areas. Forty per cent of dwellings were proposed with floor space of between 100 and 150 square metres and 50 per cent were proposed with floor space of between 150 and 180 square meters (Table 8.29). In contrast, in the inner city area, the extent of affordable floor space differed between governmental employees and that of the whole city. Some 68 per cent of applicants in Arak could afford dwellings with between 105 and 134 square metres of floor space, while 21 per cent, who were mostly governmental employees, could afford 79 to 91 square metres (Arseh Consultants, 1989:51).

Table 8.29  Dwelling types in Mohajeran new town based on housing affordability

<table>
<thead>
<tr>
<th>Floor space (Sq.m.)</th>
<th>Major industries</th>
<th>%</th>
<th>No.</th>
<th>Second level industries</th>
<th>%</th>
<th>No.</th>
<th>Total</th>
<th>%</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-80</td>
<td></td>
<td>10</td>
<td>500</td>
<td>30</td>
<td>2,400</td>
<td>22.3</td>
<td>2,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-130</td>
<td></td>
<td>40</td>
<td>2,000</td>
<td>55</td>
<td>4,400</td>
<td>49.2</td>
<td>6,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150-180</td>
<td></td>
<td>50</td>
<td>2,500</td>
<td>15</td>
<td>1,200</td>
<td>28.5</td>
<td>3,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>5,000</td>
<td>100</td>
<td>8,000</td>
<td>100.0</td>
<td>13,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


In the context of the government response to the land needs of low income people several important issues are to be considered (housing affordability is a separate issue). One response to this concern was considered in the new land development policy through the 1988 regulations regarding lot appreciation. As discussed in Chapter Five, since 1988 the MHUD priced lots based on six criteria of size, density, accessibility, number of sides, distance from social services and physical desirability (see Table 5.1). At the time of preparation of project layouts, consultants had to prepare a price list for all lots. It was presumed that those applicants who could not afford expensive allotments, could obtain a
small allotment at a low price. However, these regulations applied only to those who were eligible to land applicants from the ULO.

As noted above, according to land allocation regulations, among several conditions for receiving a piece of government land, one related to affordability. The ULO's land applicants must be able to afford to build housing using their own savings and borrowings from banks. Therefore, the very low income people had to apply through other organisations. Chief among the organisations responsible for providing housing for the poor has been the Housing Foundation, established in 1979 in the immediate period after the revolution. As discussed in Chapter Three, this organisation was responsible to provide cheap housing for the poor. Nevertheless, while the ULO provided over 50 per cent of the supplied land, the lack of consideration of low income people may be considered as a serious shortcoming of the urban land policies.

8.5 Prospective: future growth and change in Arak

Although a detailed look at the potential growth and expansion of Arak is beyond the focus of this study, a brief consideration of the city's future is made here. By updating the city's situation, this section addresses future problems. The implication and experiences from the implementation of the new land development policy might be manipulated for future growth and efficient development.

If earlier projections of population increase are accurate, the population of Arak would have increased to a maximum of 300,000 for 1991 and 400,000 for 2001. The maximum proposed population that could be accommodated in the city, as proposed in the 1986's master plan, was 360,000. However, according to the most recent data available, the population of Arak reached 368,700 in 1991 (Parhouse, 1992a:2). In other words, instead of reaching its projected population in ten years, this took only six years. If the 6.8 per cent annual rate of population growth of Arak
between 1986 and 1991 continues, the population will reach 1,374,354 by 2011, an additional 1,056,654 people. If the total population of the new town of Mohajeran is 250,000, there will still be a need to accommodate an additional population of 755,654 (Parhouse, 1992a:3).

As a response to this rate of population growth of the city, the new land development projects in the city discussed above can be seen to be only a short-term planning solution. At this stage, prospects for future growth and change in the city and region appear to hinge largely on questions of new industrial development in the region. The new town of Mohajeran may also be considered as an example of medium-term planning. Although the two heavy industries - the oil refinery and petrochemical plants - will form a basis for the development of Mohajeran new town, a substantial proportion of its eventual development will be generated by the new population of Arak. The city anticipates a continuing high level of economic development in the future, with consequently more urban expansion.

Because of their awareness of the seriousness of the problems of physical expansion of the city, the relevant authorities, most importantly the MHUD, have recently proposed a long term planning scheme for Arak. In 1993 the High Council of Planning endorsed a work program which required the MHUD to propose a metropolitan strategy incorporating several spatial plan options. The MHUD has been undertaking work towards the preparation of a metropolitan strategy for Arak and the new consultants -Parhouse Consultants- submitted a report on this for the Arak region in 1993.

The principal issue for the spatial plan options is accommodation for the projected future population. There are several other small population centres such as Sarband and Astaneh in the region but they cannot absorb the projected rate of new population because: firstly, the concern with converting good agricultural land to urban use, and secondly, their location far from major infrastructure such as national
Figure 8.10 New town alternatives for Arak

LEGEND:

- Arak
- Alternative sites for new towns

Source: Based on Parhouse Consultants, 1992a.
roads and new industries. These options are essentially based on projected future distributions of population and employment. The long term development options study identified four broad growth centres for Arak (Figure 8.10). Analysis of these options included an assessment of transport costs, social and physical infrastructure and employment. In 1991, of the total population, the potential active population was 20.6 per cent and the unemployment rate was 2.2 per cent. Within the active population, the unemployment rate was 9.7 per cent. The literacy rate in 1991 was 83.5 per cent. It was recommended that the new city of Amirkabir (alternative number one) be the first priority for inclusion in the city's development program.

8.6 Conclusion

This final chapter of the case study examined the contemporary responses to land development pressure in Arak through the assessment of the most recent projects implemented under the new urban land development policy of 1985. Arak has been one of the fastest growing cities in Iran in the past years. Prior to the initiation of the new policy, new areas of the city, like in other Iranian cities, were likely to be characterised by squatter settlements and slum areas. The new policy was initiated to prevent this problem. The results of the new policy in this city are important in the context of the various factors that have contributed to the rapid growth and expansion of the city.

The policy has succeeded to some extent in reaching its goals, including: preventing the spread of squatter settlements through providing sufficient residential land; providing some major infrastructure elements including adequate roads, water, drainage systems, and electricity in all new areas; preventing land wastage and protecting the agricultural land through the policy of high density development; preventing urban sprawl through the policy of creating planned new towns; financing the provision of infrastructure through the user-pays system, consequently
eliminating use of governmental funds for the development of new urban areas; and controlling the cost of developable land.

Several suggestions are made regarding the responses of new projects to housing, land and infrastructure. Data analysis revealed that sufficient residential land has been successfully supplied, however, this did not imply that housing has been provided at the same rate. Factors including the weak administrative process of construction permission and shortage of construction material have caused remarkable differences between the amount of supplied land and the number of constructed dwellings. In the context of infrastructure provision, it was argued that the key infrastructure elements have been provided and the user-pays system was successful overall. However, it should be noted that as Table 8.26 reveals, the proportion of land and infrastructure costs to total house price has been very low. The proportion of land price to total housing construction in the free market was approximately 35 per cent in 1986 (Arseh Consultants, 1989:29). Consequently, new residents supported the user-pays system.

The points made in Chapter Five in relation to the effectiveness of user-pays system, also apply to the projects implemented in Arak. This result supports the relationship between the success of the user-pays system and location and physical conditions of projects as was found at the national level in Chapter Five. Furthermore, the patterns of land use and density level influenced the amount of user payment. Projects such as the "70-Hectare Project" which were designed low density with the domination of single houses, were the most successful projects. However, this result is not appropriate when it causes urban sprawl, higher development costs and land wastage, particularly in cities such as Arak with a serious land limitation.

Several ineffectiveness have also been identified in the urban land development as practiced. The first is related to the lack of comprehensive and long term plans. Generally speaking, sporadic attempts have been made in response to the problems...
of land development in Arak. The existence of the ULO's land was the only factor in
decision making for the response to the needs of growth and expansion of the city.
The lack of fundamental planning processes such as rigorous estimation of needs
and the selection of sites to address these needs were examples of the lack of
comprehensive planning.

A second example of ineffective planning can be seen in decision-making about
density. Over time, the density of new projects tended to increase because of
awareness of the problems of land and housing demand. Although the data analysis
revealed higher densities were more economically viable, such as the experience in
"102-Hectare Project", changes caused delay in development. Therefore, an
eexample of the implications of the lack of comprehensive plan can be seen in the
process of density change which affected timely development of new projects. A
further example of ineffective planning caused by the lack of comprehensive plan
can be seen in the process of the Gerdoo Project development. The project was
developed even though it confronted two serious problems. Firstly, the project was
amongst the most expensive sites to be developed. Secondly, the MHUD proceeded
to develop the project before adequate provision for water, the most vital
infrastructure element, was provided by the responsible water board.
Chapter Nine

CONCLUSION

9.1 Introduction

This study shows that there is a complex array of topics within the area of urban land development of great importance for urban planning in the Middle East. However, in the region itself, including Iran, very few studies from local or international origins have focused on land development. Chief among the local works are; the study by Mowlazadeh (1991) on Iranian post-revolutionary land policy (not urban land development policy) taken from cultural, legal, and organisational points of view, and, in the region; a study by Al-Yemeni (1986) on Saudi Arabian land development policy from cultural and environmental points of view, and the study by Feiler (in Shidlo, 1990:121-139) on new towns in Egypt, focusing on their ability to respond to housing shortages and urban growth in that country. Some idea of the challenge facing researchers will be appreciated when it is realised that almost nothing is available in the way of critical evaluation to guide Middle Eastern states about land development policy outcomes.

This study has undertaken a selective post-implementation evaluation of land development policy in Iran for the first time. The 1985 urban land development policy has had, as this research has shown, a notable impact on Iranian urban development, affecting a large majority of the population. The study has explored the results of government attempts to cope with urban expansion and has questioned the value of policy objectives that do not appear to be logically chosen, well organised or capable of evaluation. Indeed, it has been demonstrated here that insufficient thought seems to have been given to monitoring policy outcomes satisfactorily. That is not to say that this task is easy or straightforward and it should be the responsibility of a specially commissioned investigative team.
This conclusion returns to the initial hypothesis and research questions and assesses them in the light of subsequent policy evaluation. The first task in any post-implementation assessment is to decide which objectives are important and to be given greater priority. Firstly, it was argued that the large amount of publicly acquired land in the period after 1985 was presumed to be adequate to meet national demands of urban growth. However, it was also recognised that it is the way in which this land is developed and distributed, as well as the effects and implications following its utilisation, are important issues to be considered by government. Secondly, it was suggested that the provision of land to accommodate shelter does not ensure that the resultant housing is necessarily adequate. The introduction of basic infrastructure and public facilities, as well as environmental safeguards, are essential physical elements that can determine whether a house in a new suburb presents an adequate space for living. The question remains whether this goal has been achieved by the changes to land development policy in Iran.

In order to simplify and clarify the long list of loosely defined objectives set out in the policy itself (Table 1.1), the study has focussed on the two key areas of land supply and infrastructure provision, plus the missing factor of environmental quality. Although these concerns are difficult enough to cope with in most developed countries in the industrialised world, the situation in Iran with its high annual urban population growth rates of up to 5.4 per cent, is critical. Clearly, if effective urban land development policies are not found to address these key areas, peripheral urban growth will be unmanaged and result in shanty town neighbourhoods of a kind that are physically, socially and politically unacceptable.

There are choices to be made in the selection of criteria chosen for policy evaluation. It is argued here that the official list of policy aims (Table 1.1) is far too general in content, making realistic assessment by government almost impossible. For example, in objectives 5 and 13, the MHUD acknowledges that infrastructure provision is
important, but in objective 4, it emphasises that government should concentrate on other issues, such as education and production, rather than infrastructure provision for new urban areas. Clearly these objectives are both important and interdependent. Furthermore, some important features are completely missing. For example, whilst environmental concerns, such as sanitation, are becoming critical, particularly in industrial cities like Arak, there are no clear procedures laid down for coping with it. Another missing objective concerns ways of providing funding for infrastructure provision when public finance is withdrawn and becomes unavailable.

For these sorts of reasons, it was hypothesised that an adequate and realistic assessment of the new policy demands the introduction of a monitoring process based on the inclusion of normative and more precise evaluative criteria, in place of the 14 official aims. The objectives should be appropriate and achievable and in a form that allows strategic performance to be evaluated. Clear performance indicators could then allow progress to be measured periodically. It is recognised, however, that monitoring is not an end in itself and will need to be matched by managerial mechanisms that will allow policy adjustments to be made if required. This introduces a wider set of implications for the government that extend beyond the scope of the present study. According to this approach, criteria in the broad areas of effectiveness, equity and environmental quality were chosen to illustrate and investigate the appropriateness or otherwise of present urban land development policy in resolving problems of rapid urban expansion in Iran.

9.2 Findings and implications

Public land ownership and urban residential land supply

The first research question examined the extent to which the new urban land development policy has been successful in meeting demands for land and infrastructure provision in the new urban residential areas.
The supply of land was considered in the policy objective list (7 in Table 1.1) which states: "to provide land on a large scale in reply to the society's need for housing". However, it is suggested here that this objective has been incorrectly listed in the table. The reason for this suggestion is that the new urban land development policy itself did not have any role in raw land supply. Instead, the ULO was responsible for implementing post-revolutionary Urban Land Law (ULL), in the acquisition of land. The new urban land development policy was then responsible for developing these public lands, particularly in the provision of basic infrastructure. This study investigated the way in which the new policy developed these public lands and handed the developed land to the ULO for distribution. This public land ownership has played a key role in the process of land development policy which is discussed below.

In Iran, post-revolutionary urban land policies were based on national religious principles in which land was considered as a 'free good' and a 'gift of God'. A similar approach is found in some other Islamic countries such as in the Maldives (McAuslan, 1992; Mowlazadeh, 1991). As noted above, the 1985 urban land development policy was based on the principle of public land ownership and it is argued here that there are advantages and disadvantages with this approach. Positive features include improvement in urban growth management, better affordability and decreased land costs (Darin-Drabkin, 1977:88; Roberts, 1977), but negative factors include: a lack of long-term management concerns together with a lack of expertise in local governments; land wastage resulting from a lack of accurate and complete information on land reserves transactions, and the practice of illegal transactions because of large differences between government land prices and the free market (Kitay, 1985; Farvacque and McAuslan, 1992).

Whilst the potential of public land ownership in increasing and control over urban development is immense, it is deduced from the foregoing that this form of land
ownership is not necessarily effective in all aspects. Although, with respect to the first research question, the government supplied enough developed land (land with associated basic infrastructure) to cope with demands at both national and case study levels over the study period, and several problems were identified. The following discussion examines two chief disadvantages of public land ownership in Iran, including delays in land supply and land wastage. In addition, some general advantages of public land ownership are discussed.

Disadvantages of public land ownership in Iran

It was argued previously that an effective development policy must provide land with associated infrastructure and on time. However, in Iran, the lack of clear and effective regulations, particularly in the initial years of implementation of the new urban land development policy, caused delays in land supply. This was also acknowledged by the ULO itself (ULO, 1992:7). The most important reason for these delays was related to the requirement that infrastructure be provided before land was distributed. Until 1985, the ULO had distributed raw land but since then, it had to allocate land plus the associated infrastructure. But co-ordination between the central MHUD and its provincial offices, approval of plans, and the selection of consultants had to be undertaken in the central MHUD office in Tehran. A complex circulation of funds under the user-pays system also contributed to delays in both land supply and the provision of infrastructure since all the funds collected were to be passed through the central ULO and DHA. One of the most important consequences of these delays was the fluctuating supply of developed land, particularly in the initial years (Figure 5.9), illustrating the lack of long-term planning.

The second negative implication of public land ownership is found in land wastage. A proposition supporting public land ownership is that it provides land for various social needs and decreases or stabilises land costs. To achieve these goals, it is necessary to use land properly. However, the Iranian case indicates generally adverse
results. Before the initiation of the new policy, as well as in its initial years, almost all land distributed by the ULO was planned to accommodate low densities with one-storey houses, such as Panjhezar Vahedi and the "70-Hectare" projects in Arak. This can be interpreted as a waste of land, particularly in cities such as Arak with serious land shortages. Increasing residential density in most of the recent projects, such as the Gerdoo and "102-Hectare" projects in Arak, can be seen as evidence for a waste of land resources in the initial years.

Advantages of public land ownership in Iran

A positive impact of public land ownership in Iran, however, is found in the process of user-pays for the government itself (the *results* of the user-pays system and its implications are elaborated later in this chapter). Public land was distributed at a relatively low price and total governmental land price and infrastructure costs for new settlers was much less than for land in the free market. Indeed, this was a major reason that most new residents paid for the costs of infrastructure willingly. In other words, the adoption of public land ownership was the important factor making it possible for the MHUD to implement the user-pays system under the new land development policy. This measure clearly enjoyed considerable support from those able to afford these subsidised costs.

One of the factors considered in the official support of public land ownership is related to the prevention of land speculation, consequently, decreasing or stabilising the land price. This has been an important goal of public land ownership considered elsewhere as discussed in Chapter Two. In the Iranian case, restricting the amount of land held by landowners and prohibition of land transactions except to or from the government were the key features of land policies. Table 8.20 reveals that the extent of increases in land prices in Arak was much less than that of housing between 1991 and 1992. The reason for this was that there was a substantial difference between the amount of land provided by the ULO and the number of construction permits issued
by municipal councils at both national and local levels. These differences are attributed to the following factors: the lengthy administrative process involved in obtaining building permits from the municipal council; a reduction in private sector investment in the housing sector due to dramatic increases in the costs of materials; and a reduction in government investment in the housing sector.

With respect to the first research question, it can now be suggested that the question could be designed in another way. As noted above, the successfulness of the new policy in terms of land supply totally depended on the activities of the ULO and the extent to which it supplied land. Therefore, with the awareness that the new urban land development policy was not responsible for land supply, but the responsible for development, the question could be designed in this way: Was the way in which public land was developed and distributed effective in terms of meeting the demand?

**Infrastructure provision**

Three research questions (1, 2 and 3) were related to the provision of basic infrastructure for new urban residential areas in three different aspects. The first was the effectiveness of the new policy in overall provision of infrastructure. The second was related to financial participation by applicants through their contribution towards costs of development. The third question was related the provision of basic infrastructure from environmental points of view.

**Effectiveness**

In the light of the first and second sets of research questions, the study has assessed various considerations in the provision of infrastructure. The MHUD has actively intervened in infrastructure provision in new urban residential areas in order to better manage the whole process of land development. This was generally considered the most important objective of the new policy. However, questions surrounding effectiveness and equity in infrastructure provision result in some conflicting issues.
Under the effectiveness criteria, for example, two things were considered: first, the provision of basic infrastructure and second, financial participation by applicants through their contribution towards costs of development.

It is financing infrastructure that is shown in the literature to be the most critical issue. Each method of financing has shortcomings. For example, the monopoly provision of services by governments gives rise to many problems including limits imposed by the availability of public funds, and various administrative shortcomings. Negative features worth noting are the concern of the private sector about investment risks, legal restrictions, problems in delivering basic infrastructure to the poor, lack of co-ordination, and difficulties in clarifying the responsibilities of various departments involved.

However, the literature reveals that there has been little attention given to the implications of a direct user-pays system of infrastructure provision in new urban residential areas as employed in Iran. Most policies and research have concentrated on the implications of transferring the burden of responsibilities of the public sector to the private sector (as discussed in Chapters Two and Four). A user-pays system can have significant implications, particularly when it is employed at the national level affecting a large majority of people. Under the Iranian user-pays system for land development, the larger the advance payments, the greater the ability of MHUD to provide basic infrastructure, including local roads, water, electricity, sewerage and drainage systems. This means that if MHUD does not obtain enough funds from the consumers, adequate infrastructure cannot be provided. The following discussion deals with the analysis of the user-pays system and its implications.

The first issue to be considered under the criteria of financial effectiveness concerns the question of cost-recovery. The analysis highlights several important issues in the Iranian user-pays system. Overall, the data show that government obtained enough funds from users to make the provision of basic infrastructure in the new residential
areas feasible resulting in the implementation of many projects. However, it was found that the cost-recovery process varies widely between each project. This is an important issue since projects that have a negative balance for long periods place a large burden on the public purse. Various factors influence the user-pays system causing different levels of success to be achieved, including those of: project scale, city size, financial status of applicants, and physical conditions of the projects. But, as Table 1.1 and the urban land development regulations (Appendix 2) have shown, none of these factors were considered under official policy procedure. The policy should consider variations and the effects of various factors in designation of policy objectives. Examples of the effects of such factors are discussed below.

It is also suggested here that the application of 'economies of scale' through reducing material costs through mass production, has been demonstrated by this study. Financial returns were found to be proportionate to size of projects. The larger the size of new land development projects, the greater were the size of individual user payments. In other words, the large scale projects succeeded better in recouping costs; medium scale projects tended to be borderline; whilst the majority of small scale projects often failed to obtain enough funds from the applicants (Figure 5.3).

Another important outcome of the policy concerns the length of time taken to provide the infrastructure. As discussed previously, in countries like Iran experiencing rapid urban growth and expansion, effective urban land development policies must provide basic infrastructure in parallel with the demand. However, under the new land development policy, there was a substantial time-lag between the allocation of plots and the provision of infrastructure. The user-pays system actually aggravated this problem. As Figure (5.2) reveals, complexities in fee collection resulted in the delayed provision of infrastructure. It was shown in the case study area, for example, that the provision of basic infrastructure for projects of 70 hectares took more than seven years. The major reason for this was attributed to the lengthy process of assessing and collecting fees. Clearly there are considerable opportunities.
to remove this kind of constraint by better management. Fee collection was also entirely neglected in the list of policy objectives. The extent to which management reforms of this kind can be implemented is a question extending well beyond the concerns of land development policy.

**Equity**

The user-pays system in Iran was also investigated in terms of equity. An important negative result of user-pays in relation to equity is seen in the way it can aggravate existing urban and regional disparities in Iran. The system was implemented under the same regulations in all cities in all regions. Data collected in this study has shown that new projects tended to attract more user-payments in the larger cities and in the more developed regions. Therefore, the system may be considered to have been more successful in large cities, as they fared better in the provision of infrastructure. This implies that the user-pays system may have contributed towards enlarging the gap in living standards in both large and small cities and between the less developed and more developed regions of Iran. Total user payments amounted to more than the governmental expenditure in both developed and intermediate provinces, while in the least developed provinces very little was recovered (Table 5.6). This result relates to specific housing and land conditions in large cities where the price of government land and the costs of infrastructure items in comparison to free-market prices were relatively low.

On the other hand, it is important to note that overall conditions of welfare and living standards were relatively higher in the large cities and more developed regions. For instance, even though Arak is a medium sized city and all projects developed there were of small to medium scale, the overall user payments totalled more than government expenditures. The reason for this was that Arak is located in one of the more developed regions of the country and, as discussed in Chapter Eight, the average income of its residents is higher than the national average. This raises
important concerns about the feasibility of the smaller projects, particularly when it is realised that the majority of land development projects in the less developed regions are in the category of small scale projects.

With respect to affordability, it should be remembered that Iran's urban land development policy is designed to serve the interests of the large majority in the country. Prior to the initiation of the new land development policy, applicants tended to acquire land at very low prices without infrastructure costs included. However, the costs of infrastructure provided under the new policy have been ten times more than raw land price, particularly in small cities, where free market land prices are relatively low. This implies that when national funds for urban infrastructure were cut back, the burden of cost was transferred from the government to the service users, including the poor who are least able to afford it. This is recognised here as one of the most important shortcomings of the Iranian user-pays system when it is enforced without subsidies for the poor. The MHUD itself could be adequately financed and provided for in the regular government budgeting process to make it possible to subsidise low income households. A move in this direction is found in a 51 billion Rials fund established under subsection 52 of the most recent annual budget, 1373 (1994/1995), directed to subsidising the housing sector, including land development projects (Keyhan Havai Newsletter, 1994, No 1075, p. 11).

It is notable that the MHUD's response to the issue of equity was considered through 1987 lot valuation guidelines only. While different lots had different values, the new 1987 guidelines valued lots based on six criteria, including, size, density, accessibility, number of sides, distance from social services and physical desirability (discussed in Chapter Five). However, the valuation policy of lots could go beyond the specified projects and could be extended to local and regional levels to better protect low-income new residents. The system requires revision with the cities and regions which have had greater success in cost recovery could subsidise the poorest regions. In other words, some part of the infrastructure costs for expensive projects in the less
developed regions could be covered by obtaining funds from more lucrative city projects in the more developed regions. This needs government support through the enactment of new and specific regulations.

**Environmental quality**

The third research question was related to the extent to which the government has been able to provide an environmentally appropriate living space in the new urban residential areas. Based on the key environmental themes, the effectiveness of the new policy in terms of environmental quality at the local level was measured in two ways: the extent to which good agricultural land is protected and in the provision of basic infrastructure.

As discussed in Chapters two and Four, the 'brown agenda', is an immediate and critical environmental problem facing developing countries like Iran (Leitmann, 1994; Drakakis-Smith, 1995). McAuslan (1992:26) says in relation to this that: "an environmentally conscious planning and development system is more likely to be an equitable one, for urban environmental disasters tend to occur among the urban poor rather than the urban rich." It is notable that environmental considerations are largely missing in the policy objectives (Table 1.1). Although, for example, objective no. 13 has some general statements about this issue, such as "to prepare a safe residential shelter from the viewpoint of urban development, architectures, infrastructure installations, urban services and upper installations", it does not clearly acknowledge environmental objectives in the way this study refers in the context of the 'brown agenda'.

**Protection of good agricultural land**

With respect to the issue of the protection of good agricultural land, it was discussed that the presence of agricultural land surrounding the city of Arak has created limits affecting the development and expansion. Degradation of agricultural land is
noticeable through both formal and informal expansion of the city. Several informal residential areas, such as the Football areas, have appeared on peri-urban agricultural land surrounding the city. The formal planning process has also failed to take land degradation into account adequately and this often accelerated the degradation of agricultural land. In the Arak master plan, for example, there is approval to use 540 hectares of agricultural land for urban developments. Sustainable environmental development demands the identification of programs and actions to redress the consequences of land development policies. An essential prerequisite for appropriate development is accurate site selection in order to preserve good agricultural land. Factors to be addressed include: encouraging increasing densities for both the established and new residential areas, initiation of a Land Readjustment Technique (discussed in Chapter Two) which has never been tried in Iran; and development of discontiguous areas and new towns.

Site selection

Accurate site selection for new land development programs is also important from the perspective of development costs. As the data collected for this study has shown, the presence of different physical conditions results in different levels of user payment, and can affect the success of the policy as a result. With respect to site selection, the examination of the user-pays system demonstrates that difficult physical conditions on sites may generate substantial negative balances. This is demonstrated in the "114-Hectare Project" in the city of Shahinshahr and the "Gerdoo Project" in the case study area.

Basic infrastructure

With respect to basic urban infrastructure, the second area of the effectiveness of the new policy in terms of environmental quality, the prime examples in new Iranian urban areas are the presence of water shortages and pollution. The shortage of water in Arak has been a key concern, particularly since the industrialisation period in the
1960s. Industrial zoning has given rise to problems of both water shortage and pollution. Whilst water has been provided through extensive use of underground water, sanitation has remained as a key problem, resulting from the lack of sewerage systems. This is significant as Arak is one of the most industrialised cities in Iran. All urban waste, including that from the industrial zone, is interred in the ground. Consequently, underground water resources are being rapidly depleted and contaminated by hazardous industrial wastes. Seepage from improper use and disposal of heavy industrial wastes are the principal factors influencing underground water pollution, as well as reducing the supply of drinking water as discussed in Chapter Six (Markazi MHUD, 1992a:11).

The contribution of new urban residential areas to environmental problems has been shown in this study to be a significant one. The new policy proposed to deal with these environmental issues through the provision of sewerage systems for new land development projects, but has not considered them within the context of sustainable development in the way discussed in this study. In most new land development projects the MHUD designed and implemented sewerage systems based on septic tank disposal. However, while there is no reticulated sewerage system in cities such as Arak, such attempts are not effective and serve only as palliatives. What is required is a proper and comprehensive system serving the whole city.

However, comprehensive systems are very expensive, and demand major investment of capital. Consequently, this places a severe financial imposition on a large proportion of urban residents. Comprehensive sewerage systems also need full maintenance management and require highly skilled personnel. Based on the most recent data available, a special organisation, called Sazeman-e Aab Va Fazelab-e Arak, has been established to design and implement sewerage systems in Arak. Nevertheless, in industrial cities such as Arak, the MHUD should support long-term planning through its contribution towards the implementation of such systems. The industrial sector, as the key water consumer, especially as industry causes much of
the water pollution, should also play a key role in this process, particularly in financial aspects.

**Steps towards a monitoring procedure for urban land development in Iran**

The new urban land development policy in Iran is not seen as a solution to overcoming the problems of rapid urban expansion in itself. There are clearly many objectives which have not been met and, based on the most recent information available, policy direction continues as before despite several changes, such as limiting compulsory acquisition of land by the ULO. The role of the ULO has not been lessened, however, and it continues to supply land together with the participation of land owners and developers. Urban land continues to be developed under the supervision of the MHUD. Since the new policy has played a significant role in enabling new residents to benefit from basic infrastructure, the MHUD is well placed to continue its administrative role in urban land development until such time as comprehensive regional development schemes can be drawn up.

However, the present evaluation suggests that a new means of assessing Iranian urban land development policy is desirable. Any new policies chosen should include consistent goals and guiding principles. Ideally, planning should be fair (equitable) in its application and the way it effects the community. It should also be readily comprehensible and responsive to the needs of people and include precision in its conceptualisation and wording. It should also have the capacity for revision, and the ability for that revision to be enforced. Based on these principles and the key findings of the study, substantial changes will be necessary to bring about alternative objectives and procedures for urban residential land development in Iran.

The success of any alternative policy will obviously depend on several factors including: initiation of family planning which has been largely neglected in the last decade; improvements in the provisions of welfare, and the creation of employment...
opportunities in rural areas to deter people from migrating into urban centres. Nevertheless, without adopting an idealistic alternative, there are still a number of policy changes which the Iranian government can make to strengthen existing procedures. As discussed above, each finding of this study led to some important implications. Based on these findings and their implications, therefore, this section will introduce a range of new monitoring procedures to be conducted by MHUD. With respect to limitations of the study, as well as focused areas, this model selects some aspects of urban land development policy. The goal of infrastructure provision is considered by way of example according to the general criteria suggested in the hypothesis and according to more detailed operational objectives (Table 9.1).

Furthermore, to make the implementation procedures operational it is necessary to set out performance criteria and targets. Therefore, Table 9.2 presents examples of performance criteria for selective objectives. With respect to the effectiveness criteria, two objectives, including simplicity and flexibility, are selected by way of examples. The table suggests the sort of data that could be regularly collected by the government to provide a periodic assessment of policy performance. Similar to the reasons suggested for Table 9.1, these performance criteria and type of data are also set out based on the findings of this study as discussed previously. For example, regarding simplicity in terms of fee collection, the local ULOs should deal with the collection and expenditure of funds. In other words, user payments should not be sent to central MHUD, nor even the provincial ULO offices.
Table 9.1 Evaluation of infrastructure provision: Examples of objectives and implementation procedures

<table>
<thead>
<tr>
<th>Criteria-Goals</th>
<th>Objectives</th>
<th>Implementation procedures (based on the findings of this study)</th>
</tr>
</thead>
</table>
| Effectiveness  | Simplicity | (1) The policy is mainly implemented by local authorities. Fee collection and selection of consultants and contractors are undertaken at the local level.  
(2) The central MHUD facilitates development, and monitors policy implementation |
|                | Flexibility| (1) The policy procedure is revised over time to accommodate changes during implementation, based on the findings of the post-implementation evaluation  
(2) Reforms, training programs for officials, as well as the education of the public are undertaken to accommodate changes |
|                | Private participation | Within reasonable limits, the provision of basic infrastructure and service by the private sector should be investigated in order to achieve efficiency in cost-effectiveness and timely development |
| Equity         | Popular participation | Infrastructure is mainly provided through financial participation of people through their contribution towards the costs of development |
|                | Affordability and prevention of regional disparity | (1) Pricing developed land based on its appreciation, and according to urban and regional status  
(2) Government subsidies to the poor. People's affordability is measured using income |
|                | Productivity | Protection of agricultural areas through accurate site selection, increasing residential densities, and initiation of a land pooling readjustment strategy |
| Environmental quality | Basic needs | Provision of basic infrastructure, including water, electricity, roads, sewerage and drainage systems, is considered as a program priority in land development policy |
|                | Health safety | Provision of sewerage system as a program priority, particularly in industrial cities |
| Feedback       | Administrative fairness | (1) Post-implementation evaluation through inviting outsiders to be involved  
(2) Collection of accurate and timely data, and full dissemination and discussion at both local and national levels |
Table 9.2 Examples of performance criteria, targets and data requirements for infrastructure provision in terms of simplicity and flexibility

<table>
<thead>
<tr>
<th>Example objectives</th>
<th>Examples of performance criteria</th>
<th>Data categories and collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simplicity</td>
<td>Fee collection</td>
<td>1) Local ULOs, the owners of land, are responsible for keeping all the following data and periodic progress reports up to date.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) The costs of each infrastructure item is determined separately by project consultants. Data will include the costs of water supply, roads and drainage systems, electricity and sewerage systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) The process of fee collection should be consistent with the length of implementation. Data will include all factors affecting the length of implementation, including preparation of plans, selection of contractors, as well as execution period. A timetable should be included with the project plans.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Local ULOs allocate adequate revolving funds. Revolving funds should cover the implementation expenditure over time, so that projects should not be stopped because of negative user-payment balance. The central ULO will financially support its local offices.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) The data will include the amounts of revolving funds, expenditure and user-payments.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Affordability</td>
<td>1) Procedures should change over time based on data and information on affordability. Data on affordability is collected through the assessment of user payments during instalments payments. Also official data on user’s income and expenditures are collected from responsible agencies to be incorporated with direct data on user payments.</td>
</tr>
<tr>
<td></td>
<td>Periodic progress</td>
<td>2) Periodic progress reports on the operation should include assessment of the time for implementation.</td>
</tr>
<tr>
<td></td>
<td>Changes</td>
<td>3) Data and information on essential changes are collected by central ULO and MHUD through regular team studies, workshops, seminars and progress reviews.</td>
</tr>
</tbody>
</table>
9.3 Iran's urban land development and urban planning

The fourth research question related to the extent to which policy implementation suggests lessons for other cities in Iran and in middle-range developing countries facing similar conditions of rapid urban expansion.

Urban land development policies are designed to guide future decision-making concerning the shaping of new urban settlements. Population growth, increasing levels of urbanisation and urban expansion are important issues for many middle-range developing countries, besides Iran, that are undergoing similar changes in physical development. Urban land development issues are extremely complex, as Choguill (1994b:36) has stated, "one must exercise caution about generalising from the studies, given the very different nature of the urban environments involved". For example, even though most developing countries are experiencing rapid urbanisation, there are considerable variations in the level of urbanisation as the World Bank categorises these countries into: heavily urbanised countries, more recently urbanised countries, primarily rural but rapidly urbanising countries, and large, heavily populated, countries (Drakakis-Smith, 1995:659).

There are also other variations such as the level of wealth and an urban hierarchy. All these variations pose different planning dilemmas, including the consideration of rural-urban migration and the demands for land and infrastructure. Nevertheless, there are many common factors influencing land development policies which can be taken into account in many developing countries. For example, McAuslan's 'first order' and 'second order' principles regarding land development in developing countries are of direct relevance to the Iranian new urban land development policy. In addition, urban land development policies have a direct relationship with planning at the urban scale, such as in comprehensive/master plans, as well as with national planning policies, such as growth centre strategies. These are discussed below.
Among the reasons that the new land development policy could not fully achieve its objectives can be seen in its isolation from other branches of planning policy. Two of these policies investigated in this study included the comprehensive/master plans and the impact of growth centre strategies on policy formulation.

*Fundamental reform or incremental change?*

There is little doubt that the post-revolutionary urban land policies have brought about fundamental changes in land tenure, allocation, transfer and regulations of a kind similar to those that have occurred in some other part of the world in recent times (McAuslan, 1992:24). The new urban land *development* policy was initially proposed as a major reform since it introduced fundamental changes. For example, the allocation of raw land was prohibited unless it included basic infrastructure. However, in reality the changes came about incrementally. Many land development projects were not implemented effectively, some regulations and controls were not enforced, and several institutional changes occurred in the process of land development. An example of the latter was the transfer of development responsibility for the "102-Hectare Project" in Arak from the MHUD to another government institution (*Sherkat-e Sarmayeh Gozari-e Bank-e Maskan*), for several reasons including economies of scale, monitoring standards and resolving the problems of fee collection.

The important principles of simplicity and flexibility are also not found in the existing Iranian new urban land development policy. For example, all project agreements, even those of only one hectare area, must be approved in Tehran. This was aggravated when, as indicated in Chapter Five, the policy experienced a long process to achieve implementation. Furthermore, all infrastructure items must have been provided in new projects. While a fundamental reform, as defined by McAuslan (1992:24) "is a unified and coherent body of law and administration which would form the basis for the operation of an economic, efficient, and equitable land
development system"; the above mentioned conditions imply that the policy was not a fundamental reform, but an incremental one. If the policy considered fundamental principles of reform, such as flexibility, simplicity, equity, and formulated the policy objectives in the way this study suggests in Tables 9.1 and 9.2, it could have achieved many of its stated objectives.

Urban land development policy and urban and regional planning

The new urban land development policy was mainly designed in isolation from other policies, such as planning at the urban scale and growth centres strategies. Urban land development planning is not simply a matter of building roads and designing public facilities. They cannot be seen as being isolated from the general process of planning at both national and local levels. For example, at the urban scale, these policies should be consistent with cities' comprehensive/master plans. However, the study found that there have been several contradictions between land development projects and the comprehensive/master plans of cities.

On the one hand, the so-called comprehensive/master plans generally consider the overall structure of cities rather than the consequences of implementation at the local development level and, as a result, many of these plans have failed to achieve their objectives discussed in Chapter Three. On the other hand, land development projects, which served a large majority of the urban population, were not always implemented as based on the guidelines contained in comprehensive/master plans. The differences between the proposals made in Arak's master plan and the new land development projects, such as doubling the density of the Gerdoo Project, demonstrate these contradictions.

Another example can be considered in terms of the spatial distribution of new projects. In some provinces and cities with small populations, large amounts of land have been developed, such as in the provinces of Chahar Mahal and Kerman. Indeed,
the availability of public land has been the most influential factor on the distribution pattern of new projects across the country.

The second important examples of land development policy isolation can be considered in the effects of growth centre strategies. As noted previously, a new growth centre strategy was initiated by the government during the 1960s, and the city of Arak was among the five industrial growth centres created for the purpose of decentralisation from Tehran. Growth centres are supposed to achieve a number of outcomes: to improve access to services by urban and rural residents; to provide better shelter and infrastructure; to promote agricultural production; to stimulate small-scale and labour-intensive industry; to utilise local resources better; and to prevent rural-urban migration (Simon, 1990:6). However, in a similar outcome to several cases found in the literature, most of these objectives have not been achieved in the case of Arak. The industrialisation of Arak demonstrates most clearly that implementation of the growth centre strategy does not guarantee improvements in regional welfare. While the heavy industries established in Arak may have made some positive contributions, for example in terms of employment, these industries depleted natural regional resources. The strategy also did not prevent rural-urban migration or decentralisation from Tehran, as the population of the capital dramatically increased from 1.5 million in 1956 to over 6 million by 1986.

In relation to urban land development policy, it is significant that during the final stages of preparing the city’s master plan in 1985 a new industrial zone was formed, which includes the oil refinery and petrochemical plant, as discussed in Chapters Six and Eight. The process of industrialisation became a serious problem for the implementation of the newly approved master plan of 1985. As discussed in Chapter Eight, the population of the medium sized city of Arak is expected to increase from 368,000 in 1991 to over 1.3 million by 2011. Clearly, present land development policy with its many inadequacies, such as lack of flexibility and simplicity, cannot cope with the new land and infrastructure demands. The policy implementation needs
to go beyond present procedures to meet the demands. Therefore, separating the impact of urban land development policies from that of other changes at the national and regional levels is almost impossible. Without a comprehensive and long-term planning strategy, any attempt to alleviate immediate problems will be bound to fail.

9.4 Further research

This study has been the first attempt at investigating land development policy outcomes in Iran. Although a substantial part of it is devoted to a case study investigating policy implementation in detail, it also set out to explain and discuss some initial aspects of the policy and its background. This has consequently limited the detailed investigation of some other important issues. The outlined findings and implications raise a number of questions for further studies.

The provision of public facilities is a field for further investigation. Parallel with basic infrastructure, public facilities such as schools, health centres, parks, and sports areas are also of importance in the context of rapid urban expansion in Iran. The demand for these facilities is reaching a crisis level in countries such as Iran with an extraordinarily rapid population growth. While government organisations remain officially responsible, the MHUD also initiated a new method to contribute towards the provision of public facilities in recent years. Until 1986, the ULO had to distribute commercial lands at the cheap government prices, with similar costs to those applying for residential lands. However, since then, the MHUD became responsible for developing public commercial lands and the use of their profits to provide public facilities. An attempt has already been made towards the investigation of this important topic by the author (see Azizi, 1995b). The paper concludes that this new policy has had both positive and negative outcomes. For example, by incorporating alternatives introduced here, the profits from the sale of public commercial land may return to the community, while previously only a few individual applicants benefited. A shortcoming of the new policy was considered in terms of institutional and
bureaucratic effects. While the residents of new urban areas need public facilities immediately, the preparation of these commercial projects took time. By adopting an approach similar to that used in this study, further important research and evaluation could be undertaken into Iranian responses for the provision of public facilities for new urban areas.

The second area of further research concerns informal land development. The study has examined planned development only and omitted the important question of informal urban land development. The urban poor, who are unable to obtain government land through legal means, are forced to expand in informal areas, as shown, in Arak, in Chapters Six and Seven. These informal developments can also affect the viability of planned developments. For example, water supply, drainage and sewerage systems in planned areas do not have to be isolated from those in unplanned neighbourhoods. Better understanding of informal settlement patterns would create a more complete picture of the needs and demands of the urban poor. Special policies must also be formulated regarding the control and/or improvement of such settlements.

Further areas for research should include more case studies. This study demonstrates that far greater insights into macro level studies are to be gained through local and focussed studies. Urban planning, like many other disciplines, is most useful when it builds on empirical work with a strong theoretical background. This study has taken the city of Arak, with its particular characteristics such as heavy industrialisation, as a model. There are many cities in Iran with a similar population size but which are not so affected by heavy industry, such as Hamadan, Kerman, Orumiyeh and Yazd. They have, however, other specific characteristics such as history, or their particular role as regional centres. Studies of these other cities are necessary so that the conditions found in Arak can be contrasted and compared.
The most effective way of gaining an insight into the urban land development policies is therefore to focus on the process of change at the local level, as demonstrated in this study. Efforts should be made to foster a better understanding of urban growth through policy evaluation in the fields of urban growth and expansion. Post-implementation evaluation can teach us much about this, particularly in those developing countries experiencing extreme problems. It can suggest alternative approaches to urban land development, such as the policy suggestions contained in this chapter. Through careful evaluation and policy refinement based on the results of evaluation there can be improved outcomes for the residents of rapidly expanding cities.
APPENDIX 1

Semi-structured interview questionnaire designed to elicit written responses

Distributed to officials, scholars and planning consultants,
January and February, 1992

This questionnaire will contribute to an analysis and evaluation of urban land development in Iran. Your responses to the following questions will be beneficial to the quality of my research.

Part I:

1. Population growth is considered a primary factor in physical expansion and development. This development conveys itself in various manifestations. How is the population growth in relation to urban expansion and development (in comparison with other factors such as income, type of housing and tenure, etc) evaluated?

2. What is the relationship between urban development and expansion and the national economy? Where does it stand in the national economy in comparison to other economical sectors?

3. The major sources of urban development and expansion are usually: people, the private sector, financial enterprises and the public sector. How do you consider the important role of each source in relation to urban expansion?

4. Urban development activities are managed and enforced through the participation of the public sector, private sector and various organisations. How are their strong and weak points evaluated?

Part II:

1. The land for new urban residential areas is supplied through various methods such as land acquisition by the public sector or participation of private land owners through various mechanisms. What are the efficiencies and inefficiencies of each method?

2. The spatial manifestations of urban expansion are contiguous, discontiguous, new towns and urban consolidation. What are the basic differences in these patterns?

3. The public sector has been responsible to finance basic infrastructure (water, electricity, roads, etc.) and public facilities (schools, health centres, green space, etc.). According to the present world trend, there has been a shift in burden of
responsibility of providing these services from public sector to private sector. How do you evaluate positive and negative aspects of this trend?

4 There are various techniques for infrastructure financing in other countries such as tax policies and land readjustment techniques. Instead, the user-pays system has been recently initiated in Iran. How do you assess this system?

5 Coordination between various organisations is one of the major problems in the process of infrastructure provision for new urban areas. Each organisation might have convincing responses about not providing or its slow speed (for economic problems and labour force). On the other hand, the provision of basic infrastructure is vital for new populations in these areas. How do you analyse this contradiction and what do you see their problem solving possibilities in?

6 Factors such as land ownership, physical location and land speculation contribute towards scattered development and urban sprawl. What are the negative aspects of this phenomenon and what are the ways in which its problems can be minimised?

7 Increasing population density in cities (through urban consolidation policy), even in countries with low population growth, is decided upon as a policy in reducing infrastructure costs, optimal land use, protection of urban fringe land and increasing urban management capabilities. How do you assess this policy and if chosen as a logical policy what are the methods of reducing its problems?

8 Social concerns are among possible phenomena at the time of rapid urban expansion. For example, lack of basic infrastructure and public facilities might result in social tensions. On the other hand, because of the rapidity of urban expansion in many cases, it is very difficult to provide these facilities parallel to housing construction. How do you explain these problems?

9 The costs of infrastructure provision are likely to be higher in discontiguous developments. On the other hand, in some cases this form of development is inevitable because of various reasons such as physical conditions. What is the common and general understanding of this problem?

10 In response to the problem of employment since there is a limitation of employment in the agricultural sector, it is likely that many cities have to turn to industry. These industries may not have any relation to either regional sources or consumption (i.e. city of Arak), but rather national function. On the other hand, these industries are major factors influencing more urban expansion with consequent problems. How do you analyse and explain this unavoidable flow and how do you confront with its negative effects?
APPENDIX 2

Article no. 11 of Urban Land Law
(Ratified on September, 1987)

The Ministry of Housing and Urban Development is obliged to develop and distribute its own land based on the country's public policy and the Cabinet Regulation in accordance with the approved legal plans.

Sub-article (1): The adaptation of layouts and subdivision plans of public lands with master, detailed and guide plans and their approval, "subject to Article no. 101 of the Municipalities Act", must be undertaken by the Ministry of Housing and Urban Development.

Sub-article (2): The state is exempted from any payment regarding stamps, tax and transaction expenses for development, subdivision and sale.

Sub-article (3): The price of distributed land must not exceed governmental land price at the time of distribution. However, if the development costs are more than governmental land price, the land is distributed in accordance with the final costs. Obtained fees which will be based on the valuation of plots, must not exceed the total costs.

Method of Land Development and Distribution

Chapter Four of Cabinet Regulation of Urban Land Law, ratified on July 1988

Article no. 40: The Ministry of Housing and Urban Development is responsible for adaptation of its land subdivision plans as well as other public lands with-master, detailed and guide plans, and their approval in accordance with Article no. 11 of Urban Land Law. The municipals must consider these plans during the issue of building permits. The Registration Offices consider these plans during transaction process.

Sub-article no. 1: The Ministry of Housing and Urban Development is obliged to adapt the land subdivision plans with cities' development plans and the latest approvals of no. 5 Commission of High Council of Planning and Architecture. If cities have guide plans, the MHUD undertakes the land subdivision plans in accordance with guide plans. Municipal councils are obliged to present the plans to the MHUD.

1 Translated by author (Mohammad Mehdi Azizi).
Sub-article no. 2: The Ministry of Housing and Urban Development will prepare and communicate the implementation regulation of this article and its sub-article.

Article no. 41: Land Development means a range of activities in which land is prepared for housing in accordance with the guidelines of the Ministry of Housing and Urban Development including: (a) determination of the level of plinth and ground, and the provision of basic infrastructure such as surfacing roads and asphalt, water and electricity supply, the systems of sewerage and surface drainage; (b) provision of public facilities such as schools, health centres, police and fire stations, parks and commercial spaces.

Article no. 42: Organisation, foundations, corporations and individual owners can distribute land if they develop their land based on the regulations of relevant organisations before distribution.

Sub-article: If housing cooperatives are able to develop land, they can undertake it in accordance with the regulations of the Ministry of Housing and Urban Development. The costs of infrastructure provided will be eventually deducted from the final land price.

Article no. 43: The owners of dayer and bayer lands including corporations and individuals, which obtain the permission of conversion and change in land uses from the Ministry of Housing and Urban Development in accordance with the Articles no. 14 and 15, and are intended to subdivide their land, are obliged to present the subdivision plans together with the land development plans and the estimated costs to the provincial offices of the MHUD.

Article no. 44: The final price of plots for housing includes the governmental land price at the time of distribution plus all development costs proportionate to each project based on the guidelines of the Ministry of Housing and Urban Development.

Article no. 45: Non-residential lands are distributed to corporations and individuals by obtaining the costs of infrastructure in the beginning based on rental agreements. When the projects are fully implemented by applicants, the title of land will be transformed with obtaining the governmental land price. The rental payments will be deducted if they are adapted to the initial agreements.

Article no. 46: The Ministry of Housing and Urban Development and its organisations are obliged to determine the costs of infrastructure for residential, industrial, services, administrative and commercial lots based on the appreciation of lots in accordance with their access to roads, public facilities and land uses, so that the total obtained capital covers the final costs of each project. The above mentioned organisations are not authorised to obtain a fee than totals more than the final costs of each project.

Article no. 47: Public facilities such as schools, health centres and green space are provided through the profits gained from the development of commercial projects and distributed lands in the same cities. The land and buildings of these public facilities are transferred to the relevant organisations free of charge. The Ministry of
Housing and Urban Development will prepare and communicate the guidelines of per capita space of public facilities.

Article no. 48: The price of land for profitable units such as commercial, administrative and services must be equal to the governmental land price plus all costs of infrastructure and public facilities which are collected from land applicants. The Ministry of Housing and Urban Development is obliged to manage this so that the collected fees for public facilities are spent for the provision of these facilities.

Sub-article: The labour cooperatives have priority for profitable projects to be implemented in labour residential dwellings.

**Guidelines for Land Development (Public Land)**

(Communicated on January, 1988)

Based upon Article no. 41 of the Cabinet Regulation of Urban of Land Law of July 1988, the following guidelines are communicated to all relevant organisations.

1. The Department of Housing Affairs (DHA) is responsible for land development plans and the relevant deputy is responsible for the proper implementation of all stages of the process.

2. These guidelines include the lands owned by the Urban Land Organisation (ULO). The process is as follow:

2.1 The provincial offices of the ULO introduce all land parcels which are over 10 hectares, including those previously acquired and those will acquire from now on, to the provincial offices of the MHUD for development.

2.2 The provincial MHUD and ULO recognise lands which are suitable for development based on urban development policies and regulation, with a list priorities for development.

2.3 After the identification of suitable lands, the provincial offices of the MHUD prepare reports. These reports include at least the following: legal documents regarding comprehensive/master plans; estimation of infrastructure costs for each item; the existence of applicants based on the report from the provincial offices of the ULO; and other necessary reports.

2.4 All above mentioned reports are first considered in the Provincial Housing Coordination Council (PHCC). After the approval, the implementation agreement between the relevant general director of the provincial office of the MHUD (as executive) with the DHA is put in order and sent to the Office of Land Development in the MHUD. The attached documents include: a copy of registered title as the ULO land, the approval of the PHCC based upon the necessity of the development of the given land, the report on the infrastructure items and the estimation of costs.
2.5 When various aspects of the projects are considered and controlled - such as the necessity of the development, examination of economic and social reports and their adaptation with housing policies - the final agreement is signed by the executive and the DHA principal, and is communicated to the relevant offices.

Sub-article: The implementation of project can be vested in other organisation by the DHA principal.

3 Preparation of land development plan and the process of approval:

3.1 After the communication of land development agreements, the relevant organisations prepare planning and architectural plans based on the detailed guidelines of land development contracts through their own personnel or through the private consultants.

3.2 In order to select the consultants, the provincial offices of the MHUD introduce their preferred consultants to the Consultants Coordination Council (CCC) of the MHUD. After their approval, the provincial offices of the MHUD will prepare contracts based on the land development fees indicated in the typical land development contracts.

3.3 In order to improve the quality of urban development plans, some land development plans can be prepared through competition. In this case, the relevant organisations will determine the level of competition, and the winner consultants are selected. In this case too, the 2.3 article will be processed.

3.4 Land development plans can include all or part of land development contracts.

3.5 All land development plans must be examined and adapted by the provincial offices of the MHUD with the current planning regulations.

3.6 After the provincial office of the MHUD approved the plans, they will be examined in the PHCC.

3.7 In those cities where urban development plans are currently being prepared, the provincial offices of the MHUD will ask the city consultants to cooperate by studying the prioritised area of new land development projects. It is imperative that the new land development plans must be adapted with the city's development plan.

3.8 Those new land development projects which are selected to be implemented and added to the cities' limit, either contiguous or discontiguous, must follow the cities' comprehensive/master plans. In these cases, development are occurred only on the lands owned by the ULO.

3.9 If the first stage of new land development plans (layout) is contrary to the master, detailed or guide plans, the new land development plans must be examined in the relevant authorities. After approval they are permitted to be implemented.

3.10 Both the first and the second stages of those plans with less than 10 hectares area are approved and implemented at the local level by the provincial offices of the MHUD.
3.11 The first stage of all projects with over 10 hectares area as well as those projects with less than 10 hectares which are prepared by the provincial MHUD personnel must be approved in the Housing Technical Committee (HTC). This committee membership is drawn from the representatives of the provincial offices of the MHUD and ULO, Architecture and Planning Department, DHA, Technical Department and Technical Unit of the ULO. The director general of the Office of Land Development is the secretary of the committee.

3.12 The Technical Department of the MHUD communicates the method of approval of the second stage of the projects with over 10 hectare area at the local level.

3.13 The method of payments to consultants is undertaken based of the MHUD guidelines.

4 Execution operations:

4.1 The Technical Department of the MHUD is responsible for the supervision of the third stage of implementation of all projects (execution).

4.2 After the approval of the second stage of plans, the executive organisations undertake the implementation based on the operation timetable. The organisations can execute the projects by their own personnel or authorised contractors. The selection of contractors is undertaken through the introduction by the provincial offices of the MHUD and the approval of the Technical Department.

4.3 The method of execution in various stages are undertaken based on the guidelines issued by the Technical Department.

4.4 While the Technical Department supervise the proper execution of the projects, it is responsible to comment on the payments to contractors to the DHA based on the progress achieved.

5 Financial process:

5.1 The project executives request revolving funds from the DHA based on the design and implementation to commence implementation.

5.2 When the request is approved, the DHA principal orders to financial executive for payments.

5.3 After payment order, the cheque is issued.

5.4 When the first stage of plan is prepared, the provincial offices of the MHUD and the Office of Land Development are obliged to send the layout to the provincial offices of the ULO. These plans must include all lot details and the cost proportion of each lot based on Appreciation Guidelines together with the date of lot distribution to applicants.
5.5 The provincial offices of the ULO are obliged to allocate lots to applicants based on the relevant guidelines and obtain the first instalment of infrastructure fees, and deposit them in an advised account in Maskan Bank.

5.6 The provincial offices of the MHUD are obliged to execute only those projects where there are enough applicants for them based the report from the provincial offices of the ULO and the lots have already been allocated.

5.7 The DHA is obliged to spend with care.

5.8 When the revolving funds are paid to the executives, the Technical Department comments to the DHA on the next payments.

5.9 The Executives send the expenditures documents to the Technical Department and in turn and after control the Technical Department sends the documents to financial executive. These amounts are deducted from the executive debts.

5.10 The project executives must anticipate all necessary actions for design and implementation during the agreement arrangements. They should predict the number personnel needed and preparations required together with the required expenditures.

5.11 The provincial offices of the ULO collect the remained instalments based on the appreciation guidelines.

6 If housing cooperatives are able to implement land development projects and their authorities are approved by the provincial offices of the MHUD, they can implement projects through their own personnel or through contractors after the plans are approved. The distribution of these lands are based on the above mentioned guidelines.

7 If those relevant organisation which supervise the implementation process accept to prepare plans, they have priority.

8 When execution operations are finished, the provincial offices of the MHUD deliver the infrastructure items to the relevant organisations. These organisations report any deficiency to the MHUD offices. In turn, the offices ask the contractors to repair the deficiencies.

9 When the MHUD offices announce that a proportion of the developed lots are ready for allocation and delivery, the ULO offices can deliver the lots to applicants if this is not an obstacle for continuation of the implementation.

10 The ULO offices send a report on the allocation of lots to the MHUD offices in the context of Article no. 8 of these guidelines in order to deliver the lots on the ground.

11 In order to transfer the title of land to applicants, it is necessary that applicants have paid all payments based on the final costs reported by the MHUD offices.
APPENDIX 3

Figure A.3.1 Arak initial master plan
Source: Group-9 Consultants.
Figure A.3.2: Arak master plan, prepared in 1986.
Figure A.3.3 The "70-Hectare Project" layout

This layout was prepared by the Markazi ULO and its lots were distributed to applicants before 1985. Provision of basic infrastructure on the basis of this layout was undertaken under the new urban land development policy.

Source: Provincial office of Urban Land Organisation in Arak.
APPENDIX 4
THE SURVEY QUESTIONNAIRE
(Distributed to the provincial offices of the MHUD and ULO in October, 1994)

<table>
<thead>
<tr>
<th>Name of land development project:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of agreement</td>
<td>flats</td>
</tr>
<tr>
<td>Designed area</td>
<td>houses</td>
</tr>
<tr>
<td>Sum of agreement</td>
<td>total</td>
</tr>
<tr>
<td>Latest sum</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure costs for one square metre land</th>
<th>Number of completed units in the project</th>
<th>Number of settled households to date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Operation process</th>
<th>Date</th>
<th>Year</th>
<th>Expenditures</th>
<th>Year</th>
<th>User payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication of the first agreement</td>
<td></td>
<td>1985</td>
<td></td>
<td>1985</td>
<td></td>
</tr>
<tr>
<td>Communication of the latest revised agreement</td>
<td></td>
<td>1986</td>
<td></td>
<td>1986</td>
<td></td>
</tr>
<tr>
<td>Design approval</td>
<td></td>
<td>1987</td>
<td></td>
<td>1987</td>
<td></td>
</tr>
<tr>
<td>Execution plan approval</td>
<td></td>
<td>1988</td>
<td></td>
<td>1988</td>
<td></td>
</tr>
<tr>
<td>Contractor agreement</td>
<td></td>
<td>1989</td>
<td></td>
<td>1989</td>
<td></td>
</tr>
<tr>
<td>Execution commencement</td>
<td></td>
<td>1990</td>
<td></td>
<td>1990</td>
<td></td>
</tr>
<tr>
<td>Roadbed completion</td>
<td></td>
<td>1991</td>
<td></td>
<td>1991</td>
<td></td>
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<tr>
<td>Asphalt (major roads)</td>
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<td>Asphalt (secondary roads)</td>
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<td>total</td>
<td></td>
<td>total</td>
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<tr>
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<td></td>
<td>Needs for completion</td>
<td></td>
<td>remained user payments</td>
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<td>Electricity completion</td>
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<td>Sewerage completion</td>
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<td></td>
<td></td>
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<tr>
<td>Construction of first residential unit</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Settlement of first household</td>
<td></td>
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ADDENDUM

PUBLISHED PAPERS
The Provision of Urban Infrastructure in Iran: An Empirical Evaluation

Mohammad Mehdi Azizi

Summary. Servicing new residential areas has been a major problem in the context of rapid urban expansion. While public expenditure has traditionally played a major role in infrastructure financing, finding and establishing new methods of financing have recently been an important issue. Iran has found the user-pays system to be an efficient financing method. The first part of this paper analyses the nature, significance and process of urban infrastructure provision. The second part looks at the new policy of urban land development in Iran during 1985–90. It goes on to examine the effectiveness of the user-pays system in Iran and the impacts of various factors on the system such as city size and the scales of projects.

Introduction

Rapid population growth in countries such as Iran has produced a very high demand for housing and rapid urban expansion. If this expansion of the cities is not handled with care and attention, new urban residential areas are likely to be characterised by slums and squatter settlements. Among the problems associated with this rapid expansion, for example, have been: the emergence of many urban centres with haphazard and poorly integrated development and without most of the basic amenities required for a decent standard of living (e.g. water, electricity and roads); and increasing incidents of environmental degradation (Azizi, 1993).

An important transition in urban land development as a whole, and urban infrastructure provision in particular, has taken place in Iran since 1985. The new urban land development plan had a broad range of goals. Its initial objectives were: to supply residential land together with needed infrastructure and public facilities; proper urban development; participation of the public in the provision of infrastructure and public facilities; reduction of government and municipal expenditures on these services; control over the urban landscape; exercising of public policy in housing provision; and subsidising of low-income groups. Financing these new land development projects was based on the user-pays system. This paper aims to initiate an analysis of the new plan for the first time, and the Iranian experience with a user-pays

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system for the provision of infrastructure in new urban residential areas.

Urban Infrastructure: A Discussion

Nature and Significance

Sufficient size and reasonable quality do not ensure that a house is necessarily adequate. Infrastructure and public facilities are vital physical elements that change a housing structure into an adequate space for living. Subsequently, in making any attempt to supply housing, infrastructure and public facilities are essential elements.

Much has been written about the values inherent in the provision of urban infrastructure and many ideas ranging from the very general to specific have been presented in the past (Linn, 1983; Porter, 1986; Roth, 1987; Stein 1988; Ausbel and Herman 1988; Feldman et al., 1988; Kirwan, 1989; Steinberg, 1991; Gilbert, 1992; Cotton and Franceys, 1994). Ausbel et al. (1988, p. 3) for example, argue that “infrastructure is often in the forefront when we speak of the quality of life, and images of infrastructure, whether positive ones of aesthetic structures or negative ones of time spent waiting in queues, are central to our image of healthy cities and societies.” Feldman et al. (1988, p. 1) point out that “A healthy and vibrant infrastructure is essential to the continued prosperity of any nation.” Porter (1986, p. 47) emphasises that infrastructure is an essential factor for any development because without it, development will not occur.

In the context of new land development, particularly in a time of rapid urban expansion infrastructure provision becomes a critical problem. Some of the problems associated with inadequate infrastructure in built-up areas are shortage of water, inadequate roads, inefficient sewerage systems and infrastructure deterioration and their replacement costs. Undesirable physical characteristics of new areas, financing and coordination are also problems found in the servicing of new areas (see Linn, 1983, p. 132). One of the main causes of social and economic problems associated with the provision of infrastructure is delays in its implementation. It can be argued that the provision of infrastructure should occur in parallel with the construction of housing in new sub-divisions. New residents need to be provided with major infrastructure such as electricity, water and roads. However, various factors, such as financing problems, management difficulties, and a lack of coordination of different agencies may cause delays in infrastructure implementation.

Process of Infrastructure Provision

Providing infrastructure is a long process which includes financing, design, implementation and maintenance. The public sector (including all levels of government), private sector (developers, landowners, agencies) and users (residents) are involved in infrastructure provision for new areas. Issues such as institutional arrangements, environmental awareness, bureaucracy, coordination and administration are all important stages of the infrastructure provision process. Traditionally, governments have had the responsibility of managing this process, although the private sector has also been involved in some parts of the process such as design, construction and maintenance.

Coordination is an important issue in the context of the process of infrastructure provision. To provide the infrastructure for a large residential land development project, coordination of different government departments such as water, waste water, electricity, gas, roads and telephone, plus the private sector is required. For large-scale infrastructure provision, strategic policies such as national priorities and national income must be considered. As Stein (1988, p. 29) points out, “the infrastructure problem cannot be solved if it is viewed as an isolated problem. It must be addressed in the larger policy context of national growth strategies, economic development planning, fiscal and monetary policies, and federal budget priorities.” Some strategic policies may be decided at the national level by different government organi-
sations and others at local level. The coordination of small-scale projects may be performed by local municipalities, whereas the coordination may be much more difficult when the scale is large.

**Financing Urban Infrastructure**

Financing urban infrastructure is an issue of increasing importance. Because of the high costs of infrastructure provision, financing has traditionally been the most important aspect on which much of the literature is focused. Finding and establishing new methods of financing infrastructure is an important current issue. Among these methods are: impact fees, revolving loan funds, Land Pooling Readjustment Technique (in both developed and developing countries such as Canada, Australia, Japan, Indonesia, South Korea, Taiwan and Nepal), borrowing from the federal, contracting-out and linkage fees (for details, see Feldman, *et al.*, 1988, p. 95; Kirwan, 1989, p. 295; Stein, 1988, p. 120; and Archer, 1989, pp. 307–309). Many different issues are concerned in each case. For example, public-sector capital contributions and direct private investment are three areas discussed by Kirwan (1989, p. 288).

Rapid growth in construction costs, economic conditions including reductions in national income, fiscal decline of cities, tax and expenditure limitations (the notion that urban services are not productive as compared to goods manufacturing); and growth in the size of the government workforce and public bureaucracy are some of the reasons for the reduction in the national aid for infrastructure, particularly for new areas. As a result of competition among major government programmes, urban infrastructure grants (subsidies) decline. Therefore, governments have attempted to decrease involvement in urban infrastructure provision, particularly from a financing point of view. For example economic recession, particularly in developing countries such as Brazil, Mexico, Morocco, the Philippines and Indonesia has influenced urban conditions as a whole and infrastructure in particular (Gilbert, 1992, p. 437; and Steinberg, 1991).

A variety of means are currently used throughout the world to finance urban infrastructure in new areas. As the literature indicates, financial measures can be categorised in three ways including: traditional public expenditure; private-sector participation (developers' contributions or direct investment by developers); and direct user payments. These alternatives are briefly discussed below.

First, public expenditure has traditionally played a major role in infrastructure financing. It may be argued that intervention by the public sector is important because housing can be constructed individually through various methods such as contracting with a private builder. However, it is almost impossible for individual households to provide infrastructure which requires the intervention of the public sector through its various governmental departments. Some infrastructure items may generate external benefits for society other than the recipients. For example a sewerage system is vital. Benefits of sanitary waste-disposal are largely viewed by the community rather than individual households.

The second alternative in financing urban infrastructure had been through the private sector. As noted above, public expenditure has traditionally played a major role in infrastructure financing; however, national priorities change over time and the results of these changes can affect the financing of urban infrastructure. As a result of competition among major government programmes, urban infrastructure grants (subsidies) may decline. The major argument behind privatisation is that while a monopoly provision of services by governments may give rise to problems, the profit motive and competition notions in the private sector result in efficiencies (Sharp, 1990, p. 101). Economies of scale have been recognised as one of the reasons for privatisation efficiencies. Using advanced technology equipment is one tool
preferred by the private sector in large-scale agreements (Sharp, 1990, p. 110).

However, changing attitudes toward privatisation and transferring the burden of responsibility for infrastructure provision from the public to private sector may give rise to many complex issues. Investment in infrastructure provision is usually for a long period and the private sector may hesitate to take the risk. This risk can be crucial in the context of providing urban infrastructure for new residential areas. Two reasons may be suggested for this. First, coordination of various government departments responsible for provision of infrastructure items is difficult to achieve in the private sector. Secondly, it is difficult to recoup costs from residents. One of the major differences between investment in infrastructure projects and other sectors, such as industries, is the period of implementation which affects the investment return.

Furthermore, delivery of basic infrastructure to the poor remains a problematic issue in shifting public sector responsibility to the private sector. One of the perceptions of the provision of infrastructure by the public sector has been subsidisation of low-income groups. The ability to pay is the basis of the private market. Whilst much shelter-related infrastructure is a basic need for humans, it may be seen as the justification for provision by the public sector from an equity point of view.

The third alternative for the provision of infrastructure is the user-pays system. It may be suggested that a user-pays system may be considered as an appropriate method for financing the infrastructure that should be the responsibility of those who directly benefit from them. However, this view may be criticised in several ways. One problem in a user-pays system of infrastructure provision is that there are substantial difficulties in collecting payments. In a large new urban area, the basic task of assessing and collecting is considerable. While some infrastructure items such as national defence and radio broadcasting are considered more public, the users are unidentified. These items are named as ‘pure public goods’ and there are difficulties in charging users (Roth, 1987, p. 10).

The second concern of a user-pays system, as with private provision, is protecting the interests of low-income groups. Recovering the full cost of infrastructure through a user-pays system may be suggested as creating problems for the poor. These costs are sometimes high because of the necessity for off-site services. If national funds through governmental subsidies (which have traditionally been sources of infrastructure) are cut back, the cost burden to the public would be transferred to the service users, including the poor. The first strategy in the provision of basic infrastructure for the poor might be lowering costs to affordable levels (Cotton and Franceys, 1994). Therefore, from an equity point of view, the ability of new residents to pay remains as a basic issue in the context of user charges.

The third concern of a user-pays system is the difference between the attitudes of new residents and existing residents regarding the cost recovery of infrastructure for new residential areas. It may be argued that a criticism of the user-pays system for providing new infrastructure is that it is not equitable. They pay taxes as current residents in existing developed areas, therefore, they should have access to the same services without having to pay additional costs. On the other hand, current residents may have rights in requiring new owners to pay the costs of infrastructure already provided. If a city gives new residents more than what is provided for current residents, it is fair that new residents pay for the services concerned. If a city gives new residents more than what is provided for current residents, it is fair that new residents pay for the services concerned. In some cases, people do not necessarily benefit from a particular provision. Parks, schools, libraries, roads, water and sewer lines are those which will be shared between groups and across generations.

Principles
To analyse the problems of provision and maintenance of urban infrastructure, it is essential to see them within the system of cities
in which they have emerged over time. Geographical location influences the urban system. This urban system is affected by many factors such as the impact of new technologies on urban infrastructure (Ausbel and Herman, 1988, pp. 13, 83). For example, the relationship between city size and cost of infrastructure provision is contested, as noted by Richardson (1973, p. 126): "It is sometimes argued that urban development and infrastructure construction costs are lower in medium-sized towns which offer the economies of scale and accessibility to building material sources frequently not found in small centres yet do not suffer from the high costs of development in large cities".

It can be argued that most new mechanisms, policies and research have concentrated on financing infrastructure and transferring the burden of responsibilities of the public sector to the private sector. However, it should be clarified who will eventually pay. There is little research support for the conclusion that new residents (especially first time buyers) are those who will eventually pay for the associated infrastructure costs. The conflict here is whether, in a user-pays system, people who are unable to meet the full costs should have access to the infrastructure or not. Most equity considerations arise from the participation of either the private sector or users in the process of infrastructure provision. In general, it may be argued that the provision of all infrastructure elements by the public sector, as a traditional way in almost all countries, may be most equitable. In this context, as with private provision, the concern is projecting the interest of low-income groups.

It seems that in order to establish a formula for infrastructure provision, many factors such as economic aspects, infrastructure requirements and the financial ability of future residents to pay should be considered. The condition of housing which is the base of urban infrastructure, for example, emerges within the country's urban system and should be considered as a fundamental variable in the formulation of infrastructure provision policy.

Within this framework, the rest of the paper proceeds to an empirical evaluation of the new urban land development plan in Iran as a whole and the provision of infrastructure on the basis of a user-pays system. Before examining the provision of infrastructure in Iran, it is helpful to describe the population growth, urban system, urban expansion and some housing indicators in Iran for which the new urban land development plan has been designed.

Major Factors Influencing Urban Land Development in Iran

Urban land development in Iran has to be considered in the context of population changes, settlement patterns and housing conditions. The extent of population growth in Iran has been immense in the last few decades. The 1956 population, for example, was 18,954,704, increasing to 25,788,722 by 1966, with an annual growth rate of 3.1 per cent. Although in the period 1966–76 the annual growth rate decreased to 2.7 per cent; from 1976 to 1986 it reached 3.9 per cent, the highest rate in the country's history, resulting in a population of 49,445,010 in 1986. The World Bank has estimated that the population of Iran will reach 78 million and 166 million by the years 2000 and 2025, respectively (World Bank, 1992, p. 269).

The trend in urban population growth is equally spectacular. In 1956, only 31 per cent of total population were living in urban areas, whereas this figure had changed to 38 per cent by 1966. The proportion increased to 47 per cent in 1976, and 54 per cent in 1986. The rate of urban population growth was 5.4 per cent between 1976 and 1986. It is estimated that the urban population will reach 65 per cent and 72.5 per cent by the years 2001 and 2011, respectively.

Urban System

In 1956, there were 186 cities (with a population of 5000 or more) in Iran which increased to 249 by 1966 and 367 by 1976. In 1986 there were 496 urban municipalities. In
other words, the number of cities trebled in the 30 years from 1956 to 1986. Table 1 categorises Iranian cities by size in 1986.

To respond to this tremendous increase in the number and population size of cities, two major plans have been formulated by the Ministry of Housing and Urban Development since 1985. First, the urban land development plan was concerned with providing adequate infrastructure and public facilities for new residential areas. Secondly, the policy of creating new cities aimed to counter the population growth of larger centres such as Tehran, Mashhad, Esfahan, Tabriz and Shiraz. A few new cities were also planned to meet the requirements of newly established industrial projects such as Arak and Bandar Abbas (MHUD, 1991c).

However, as Table 1 shows, a large number of Iranian cities are of medium to small size (less than 250 000 population). They are little affected by the establishment of these new cities and are expanding horizontally. Furthermore, as will be discussed later, most of the large cities have had contiguous land development projects. In brief, Iranian cities have been confronted with rapid and contiguous development and, because of probable urban population growth, the present situation will continue into the future.

Table 1. Classification of Iranian cities in 1986

<table>
<thead>
<tr>
<th>Class</th>
<th>Number</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities 500 000 +</td>
<td>8</td>
<td>11 996 093</td>
</tr>
<tr>
<td>Cities between 250 000 and 500 000</td>
<td>8</td>
<td>3 330 340</td>
</tr>
<tr>
<td>Cities between 100 000 and 250 000</td>
<td>25</td>
<td>3 374 860</td>
</tr>
<tr>
<td>Cities between 50 000 and 100 000</td>
<td>46</td>
<td>3 087 893</td>
</tr>
<tr>
<td>Cities less than 50 000</td>
<td>409</td>
<td>4 991 214</td>
</tr>
<tr>
<td>Total</td>
<td>496</td>
<td>26 780 400</td>
</tr>
</tbody>
</table>

Housing

Despite the extent of population growth from 1976 to 1986, the supply of housing exceeded the new population. The annual growth of constructed housing units reached 4.5 per cent, whereas the household growth rate was only 4.0 per cent (Zanjani, 1992, p. 3). In 1976 the number of housing units in existence was 2 377 586. Over the next 10 years, 2 308 080 residential units were constructed, nearly doubling the number of units (MHUD, 1992a, p. 7). During the period 1987–90 another 774 000 units were added. It is estimated that during the next three decades, when the population of Iran will reach 130 million, housing demand will be a major issue. In the initial period of the next 30 years, the need for housing will be 548 000 units per year while during the later years the need will rise to 851 000 units per year (Zanjani, 1992, p. 11).

There are two major factors discernible in the Iranian housing sector underlying the horizontal expansion of cities. First, is the size of the foundation or door space used in housing construction. These sizes are not only much higher than in many other countries but they are also increasing. In 1986, for example, the average floor area of existing residential units was 104 sq m, whereas the size of newly constructed units was 149 sq m in the same year. This increased to 157 sq m in 1990 (MHUD, 1992a, p. 23). It may be argued that the reason for this higher size of floor space is due to the size of families which is much larger in Iran than in many developed countries. While the size of families in Iran averages five people per household, this contrasts with less than three in western Europe. It is also the case that the allocated space per capita in Iran (at 30 sq m) is still larger than the average space per capita found in many other countries. It may be argued that these statistics show improve-
ments in housing quality; however, it influences the physical expansion of cities, and consequently gives rise to the problems of infrastructure provision.

The second indicator is the pattern of housing density, which is another way of looking at the physical expansion of Iranian cities. With the exception of Tehran, all Iranian cities exhibit low density. In 1982, 67.7 per cent of units constructed were of one storey, while 27.5 per cent were of two storeys and only 4.8 per cent were of three storeys or more. This had changed to 46.8 per cent, 36.5 per cent and 16.7 per cent, respectively by 1989 (MHUD, 1992a, p. 11). Obviously, most high-density units were constructed in the large cities, particularly in Tehran. In addition, land demands for other uses, such as transport networks, are much higher at these low densities. This, too, increases pressure for future urban expansion. These indicators reveal that Iranian cities are spreading rapidly and, without an effective policy for urban land development, the problems experienced in the future are likely to worsen.

The New Urban Land Development Plan

The post-revolutionary land laws, including Urban Waste Land Ownership Abolition Law of 1979 and Urban Land Laws of 1981 and 1987, gave the Urban Land Organisation (ULO) power of land acquisition. The ULO was formed in 1982 to implement new urban land policies and became the owner of most urban land. The activities of the ULO resulted in a large amount of residential land development across the country. In 1986, for example, its share in new housing construction was approximately 50 per cent in the country, while it reached up to 100 per cent in some cities (MHUD, 1990, p. 13).

Until 1985, the public sector had the responsibility for providing the infrastructure for new residential areas. This has traditionally been a standard policy in Iran and many other countries. For a variety of reasons, infrastructure provision was often very expensive, of low quality, and subject to delays. Each of the infrastructure items was provided at different times, creating extra work on each occasion. After road construction, for example, water reticulation was provided which, in turn, meant digging up part of the roads. In other words, little or no coordination led to unnecessary duplication and wasting time and capital.

Many of these problems could be traced directly to the absence of an efficient plan concerning the provision of infrastructure. In order to remedy the negative aspects of this lack of policy, a new measure was initiated in 1985 by the Ministry of Housing and Urban Development (hereafter MHUD) regarding the provision of adequate infrastructure in new residential areas. This new plan had a set of broad objectives, the aims of which were to address a range of issues concerning the provision of infrastructure, including its economic viability, management, environmental and social impacts. The development and distribution of the ULO’s land under the new plan for the purpose of this article is characterised as ‘land development’.

One of the major objectives of the new plan was to equip urban land with sufficient infrastructure before housing completion. The initial objectives of the regulation implementing the new plan were to provide road networks and asphalt, water reticulation, electricity, drainage and sewerage systems for all new residential land development projects. Article 41 of the regulation of Urban Land Law defines land development as:

a collection of activities in which land is prepared for housing and includes (a) basic infrastructure such as paved roads, water and electricity supply, the systems of sewerage and surface drainage; (b) public facilities such as schools, health centres, police and fire stations, parks and commercial spaces.

Amongst the basic services for new areas, paved roads, surface drainage and a sewerage system were usually provided by private contractors. Other services such as water and electricity had to be provided through
governmental organisations or, in a few cases, by municipalities. Regarding coordination as one of the most important stages in the process of infrastructure provision, two agreements for the provision of water and electricity took place between the Ministry of Energy and MHUD in 1988.

In the context of proper urban development, it may be argued that the implementation of the new plan provided a new opportunity for urban families to have access to basic infrastructure (roads, water, drainage, sewerage and electricity). For example, up until 1991, many of the new projects were totally provided with all basic infrastructure, and others were in the process of completion. Until 1992, households were accommodated in the majority of projects in cities such as Shahr-e Kord, Broojen, Bandar Abbas, Tabriz, Mashhad, Hamadan, Qazvin, Ardabil, Maragheh, Shiraz, Kerman, Zanjan, Yazd, Ahvaz and Arak.

Regarding institutional arrangements, until 1987, an existing office of the Department of Housing Affairs (DHA) managed the new projects, but when the number of projects increased, a special Land Development Office was established for that purpose. The main duties of the new office involved: drawing up land development agreements and their communication to the provincial authorities for action; the allocation of revolving funds for each project; collection of information and the communication of approved plans and maps to the provincial offices. Furthermore, a technical committee was established to consider and approve the consultants’ plans and maps for projects larger than 10 hectares. This committee membership was drawn from various departments such as the Urban Land Organisation (ULO), Technical, Architecture and Urban Planning, the DHA and provincial offices.

**Financing New Infrastructure**

As already noted, financing these projects was based on the user-pays system. The MHUD believed that public funds should be spent on more important projects at the national level than the provision of infrastructure for new urban residential areas. In other words, the new urban land applicants were those who had to pay for the provision of associated infrastructure. These payments were by instalments and were based on the size of allotments and financial ability of the applicants. For example, the applicants who wished to obtain a large allotment had to pay by two instalments and those who received medium-sized allotments could pay by three, and for small allotments they paid by four instalments. The period of payments was between the time of allocation and obtaining of plot.

The provincial ULOs, as the owners of these public lands, collected funds from the applicants and forwarded them to the central ULO. The ULO paid the Department of Housing Affairs (DHA), which was responsible for implementation of projects, and it, in turn, paid the provincial MHUD to carry out the projects. However, obtaining funds from new residents was only possible when the allotments of sub-divided lands were allocated to them. Therefore, revolving funds were needed by the MHUD for allocation prior to execution (Figure 1).

Article 11(3) of the Urban Land Law (ULL) stated that the price of land should not exceed official government prices at the time of distribution. However, if the cost of preparation of land exceeded these official prices, then the ULO could sell the land on the basis of the final costs. If at the time of completion of a project the received funds are more than the costs of the project, the MHUD may improve the quality of the project by providing public facilities such as schools, health centres and parks. In addition, in some cases which did not need any improvement in public facilities, the MHUD returns funds to applicants.

In 1988, guidelines concerning valuation of plots were prepared and brought into operation for two reasons. First, each plot had its own value due to various factors such as location and accessibility to social services. Secondly, various income groups had different financial abilities. Therefore, to respond
to housing for low-income groups, it was considered that the government should provide land at a cheaper price for them. According to these guidelines, the price of developed plots was determined on the basis of six criteria including: the size of allotments, construction density, accessibility to roads, the number of sides, distance from social services and physical desirability of plots. The major idea behind this was equity, so that low-income families could have access to land.

As already noted, the new plan had a broad range of goals. It is appropriate now to ask whether the plan has been effective and, if not, why not? One of its basic aims was to eliminate governmental expenditure on urban services. The MHUD aimed to provide new infrastructure by obtaining funds from new residents in advance. The focus of the next section of the article is to examine the extent to which the MHUD has been able to eliminate public expenditure on infrastructure provision and transfer costs to the new residents.

**Effectiveness of the User-pays System**

From 1985 to 1990, 337 projects covering 24,384 ha of land were implemented under the new plan. In 1985, the implementation of plan was started with 10 projects in 7 cities, and by 1991, almost all large and medium-sized cities were covered. In addition, some cities contained more than one project. For example, in the first year the city of Kermanshah had 4 projects and, in 1990, the cities of Hamadan, Tabriz, Shiraz, Mashhad and Arak had 17, 9, 6, 5 and 4 projects, respectively.

To assess the implementation effectiveness of the new plan, it can be evaluated in terms of its objectives. One way of examining the extent to which the MHUD has been able to approach its objective of eliminating the expenditure of public funds on infrastructure provision is by classifying the projects that have already been implemented. Different methods of classification are possible. They may be based on various different variables, such as area, year commenced, urban characteristics, city size and geographical dispersal.

However, two kinds of project were selected for analysis. First, those projects which were undertaken in the period from 1985–90 and, secondly, those which were larger than 50 ha (Table 2). Three reasons for choosing this method of categorisation should be noted. First, the process of infrastructure provision comprises various stages, such as contract arrangement and its communication, consultant selection, design, approval and allocation of lots to applicants. The projects started after 1990 were not sufficiently advanced to be analysed. Secondly, it is argued that the projects of less than 50 ha may not be so important in the...
Table 2. Projects exceeding 50 ha by year of initiation, 1985–90

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<tr>
<td>Number</td>
<td>5</td>
<td>28</td>
<td>21</td>
<td>17</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Area (ha)</td>
<td>1363</td>
<td>3893</td>
<td>2132</td>
<td>1897</td>
<td>1751</td>
<td>601</td>
</tr>
<tr>
<td>Total expenditures (m Rials)</td>
<td>11 186.6</td>
<td>35 667.1</td>
<td>32 343.8</td>
<td>9753.2</td>
<td>3354.3</td>
<td>648.9</td>
</tr>
</tbody>
</table>


context of urban expansion at a large scale. From a cost point of view and despite a relatively lower number of projects exceeding 50 ha (88 out of 337), their expenditures were 77 per cent of the total. Thirdly, the evaluation of all 337 projects is too extensive a task for inclusion in this paper.

Variables in the User-pays System in New Land Development Projects

The primary focus of this evaluation is the extent to which such projects have succeeded in recouping the cost of investments outlaid on infrastructure. The term 'expenditures' in this context refers to the capital channelled by the MHUD through the revolving funds. The details of expenditures include consultants’ expenses and the cost of providing roads, water, electricity, drainage and sewerage systems. The term ‘user payments’ refers to the funds paid in by land applicants. The term ‘balance’ means the recoupment of project costs from users, so it is the difference between user payments and expenditures. In addition, the term ‘ratio’ is used to refer user-payments as a proportion of expenditures. A ratio of 1 indicates that user-payments were equal to expenditures. The terms ‘positive balance’ and ‘negative balance’ refer to projects for which user-payments exceed expenditures or for which expenditures exceed user-payments, respectively.

It should be emphasised that the amount of user-payments was important when applied to the huge new residential areas yet to be developed. A desirable living environment for the new urban areas can be achieved by providing enough funds. In the user-pays system, obtaining enough funds at the right time could enable the MHUD fully to implement projects. In other words, the larger the advance payments, the greater the ability of MHUD to provide adequate infrastructure. A large positive balance or higher ratio indicates that infrastructure can be provided on the basis of user-payments so that public funds may be saved for basic development proposals at the national level such as education and production (MHUD, 1991, p. 6). This was one of the aims of the new urban land development plan.

Factors Influencing the User-pays System

Many factors influence user-payments and many variables should be considered in any evaluation of the success or failure of the projects discussed. Factors such as city size, project scale, financial status of applicants, location, and physical conditions of the projects may be those which can affect user-payments. Hence it could be hypothesised that there is a significant correlation between user-payments and various factors. In order to examine these correlations, an empirical review of the projects is undertaken here and a series of hypotheses is deduced. The projects were organised into several tables and ranked according to start year, project scale, city size, etc. These factors were the most important reasons for the existence of different balances or ratios discussed above.

Projects were categorised in three sizes including: large-scale projects exceeding 200 ha; medium-scale projects between 100 and 199 ha; and small-scale projects between 50 and 99 ha. Here, the most important variable was considered to be the balance or ratio
measure as discussed above. Through the consideration of this measure, significant correlations between variables were prompted, and issues for discussion were raised, to be discussed below.

One of the most significant findings was that most of the large-scale projects have succeeded in recouping costs either for the initial projects or those started in the recent years. Although seven large-scale projects had a negative balance, they were close to the borderline having ratios of 0.95, 0.91, 0.89, 0.84, 0.83 and 0.81. Most of the medium-scale projects were borderline with respect to success or failure in terms of user-payments. Finally, most of the small-scale projects have not succeeded in obtaining funds from applicants for allotments in the period undertaken in this study (Figure 2).

The first reason for the success of large-scale projects may be suggested as economies of scale. As the area of projects became larger, their relative costs could be reduced because the cost of material to be used in a project could be mass produced. It may be suggested, therefore, that these projects have been more efficiently implemented. The second possible reason is the attitude of applicants towards large-scale projects. These projects had carefully prepared plans and their design contained all necessary public facilities and were environmentally sensitive.

The second suggested factor influencing user-payments is city size. Most projects having significant positive balances were located in large cities such as Tehran, Mashhad, Shiraz and Tabriz. Among 13 projects developed in large cities (with a population over 500,000), seven projects had positive balances and four had a balance close to the borderline. For instance, an example is a 115 ha project developed in Tehran, where, despite modest expenditures on the project, applicants had paid a large amount of its costs (the ratio of user-payments to expenditure was 9.79). This can be related to city characteristics, including large size and higher land and housing values. Other examples are the two large-scale projects in the city of Mashhad, the second-largest city in the country, both of which had positive balances. Despite a higher population density considered in the recent 500 ha project in the city of Mashhad, it had one of the highest positive balances (ratio of 3.1). (One of the most recent objectives of the new plan was to reduce the problems of urban sprawl, particularly in larger cities such as Mashhad. As a result of this new strategy, higher population density became a priority in the planning of new projects.) However, the majority (20 out of 27) of the projects in small cities had a negative balances.

It may be suggested that the user-pays system should be successful in large cities. The most important reason for higher user-
payments in large cities has been the difference between the governmental land price and free-market housing price. The price of governmental land and the cost of infrastructure items in comparison to free-market housing price was very low. Therefore, it can be assumed that the applicants should have paid willingly. On the other hand, most new residential land development projects, particularly in small cities, were located in the fringe areas, where the price of governmental raw land was relatively cheap, but the costs of infrastructure were relatively high.

As noted earlier, there may be many factors influencing a user-pays system, two of which were discussed above. Other issues, such as the length of implementation, physical conditions and location of projects, may be considered in an assessment of the user-pays system. For example, physical conditions and location of projects are important factors affecting user-payments. Among the large-scale projects, the lowest negative balance related to a 314 ha project developed in the city of Shahinshahr. The negative balance of this project is likely to be related to the effects of physical conditions and city size. On the one hand, the city was a small city with 49,312 population in 1986. On the other hand, a stable soil for building construction had to be provided, which affected the cost of project.

The location of the projects can also affect user payments. Among all of the projects evaluated in this paper, only one project was a discrete development in the small city of Bojnord (population 93,392 in 1986) and had a negative balance. This may be related to the applicants’ preferences for living in inner-city areas rather than in a discontiguous new area. It can be argued that one of the problems associated with discontiguous projects is accessibility to services located in the cities. Regarding the location of these types of projects, the costs are much larger than those in a contiguous development project. Discontiguous projects need some extra costs for services such as access roads, water and sewerage reticulations, while in the system of infrastructure provision by public sector this is not as important.

The last factor may be seen as the length of implementation. Two issues may be raised. First, over time, older projects have been the most successful due to more time to collect user-payments. The projects started in 1985 were near completion or entirely completed by 1992. This may be seen as a matter of waiting. The second issue is the effects of previous projects on the new projects. Most projects started in recent years have succeeded in obtaining enough funds to be implemented. Projects initiated in the final year of the study period (1990) which have been in the initial stages (design process) comprised only six, exceeding 50 ha, accounting for 601 ha. For example, while the 1987 project in Yazd (Azadshahr) had a negative balance, the new project which started in 1990 had a positive balance. In Tabriz, a project started in 1987 (Zaafaranieh) had a negative balance, while a new project (Shahaboddin) had a positive balance. It may be hypothesised that earlier projects implemented in a city may affect user-payments for newly commenced projects. Having successful projects in the past could affect the users’ attitudes to the issue of payment in advance.

Three Case Studies

Three cases were selected to be examined. These projects were developed in three different cities in different conditions. The first case was a 290 ha project in Tabriz (a large city, population 971,482 in 1986). The second project was a 350 ha project in Shahr-e-Kord (a small city, 75,080 population in 1986). The third was a 68 ha project in Bandar Abbas (a medium-sized city, population 201,642 in 1986). In this analysis, the trends of expenditures and user-payments were compared in different years. Figures 3–5 show these trends.

Annual data on expenditures and user-payments for these case studies, collected through a questionnaire distributed to the provincial MHUD offices in the cities of
Tabriz, Bandar Abbas and Shahr-e Kord, made it possible to take into account the impact of inflation. Inflation averaged 13.5 per cent per year between 1980 and 1990 (World Bank, 1992, p. 219). While the amount of expenditures and user-payments were different in various years, inflation may affect the analysis of the results. Nominal expenditures and user-payments, therefore, were transferred into the real statistics. As can be seen in Table 3, the results changed slightly: the ratio increased in the projects which balance from the early years (in Tabriz and Shahr-e Kord) was positive, but the ratio decreased where the balance became positive in the later years (in Bandar Abbas).

The highest ratio (of 2.82) was related to a 290 ha project (Baghmisheh) which may be attributed to the conditions of the city (Figure 3). Tabriz is one of the largest cities in the country. While in the first two years the project was in the process of design and early stages such as contractor agreements, the amount of user-payments was zero. However, although the project had difficulties in physical condition and location (topography and difficult access to site), its balance became positive in its third year and, by 1991, the overall ratio of the project was 2.82. Because of the size of project, the plan had been carefully prepared and its design was environmentally sensitive, containing all necessary public facilities. Therefore, the most important reasons for this highest balance were that two factors (large city size and large-scale project) affected higher user-payments.

The second project was a 350 ha project of Darreh Mirabad in the small city of Shahr-e Kord (Figure 4). The total balance in 1991 was positive and the ratio was of 1.11. Two factors were important in this case. First, the scale of project was large and, secondly, the city is a small city but it is a provincial capital. The rate of population growth in the city in the last three decades has been increasing. While between 1956 and 1966 its annual population growth was 4.4, it increased at 5.4 per cent between 1966 and 1976 and reached at 6.4 per cent between

### Table 3. Impacts of inflation on ratio

<table>
<thead>
<tr>
<th>Projects</th>
<th>Nominal ratio</th>
<th>Real ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baghmisheh, Tabriz</td>
<td>2.71</td>
<td>2.82</td>
</tr>
<tr>
<td>Darreh Mirabad, Shahr-e Kord</td>
<td>1.07</td>
<td>1.11</td>
</tr>
<tr>
<td>Honarestan, Bandar Abbas</td>
<td>0.98</td>
<td>0.87</td>
</tr>
</tbody>
</table>

![Figure 3. Trends in real expenditures and user-payments in the Baghmisheh project, 1987–91.](#)
1976 and 1986. By 1993, roads were totally provided and other items including water, electricity and a sewerage system were in the process of implementation. Furthermore, the first house was constructed in 1988 and the first household was accommodated in 1991.

Amongst the three cases, the lowest ratio (0.87) was related to a 68 ha project in Bandar Abbas (Figure 5). As was noted earlier, the amount of expenditures and user-payments should be equal at the time of completion. In 1992 the balance of this project tended toward zero. The reason for this was that by the end of 1993, major infrastructure items including roads (surfacing and asphalt), water and electricity were provided and the sewerage system was in the process of implementation. Moreover, since 1991, the settlements of new residents were started.

Conclusion

This paper set out to evaluate the results of projects undertaken by the new urban land development plan in Iran in the period 1985–90. The new urban land development plan had several aims. The first primary aim was to provide sustainable urban development as a whole and the provision of infrastructure for new residential areas in particular using the system of user pays. The research raised some important findings and several common issues. It is suggested that the plan has
reached one of its objectives, namely the elimination of the use of public funds for provision of infrastructure in new areas and financial participation of people in the creation of their own areas.

The analysis found that the cost-recovery process varied widely between each project. The system had different implications in different conditions. Through an empirical analysis of implemented projects, factors influencing the user-pays system were recognised and various issues were raised. Factors such as city size, project scale, location, and physical conditions of the projects were amongst the most important. New projects tended to have positive balances in larger cities and the larger the size of new projects, the greater was the positive balance.

As transferring the burden of the responsibility of infrastructure provision from the public to the private sector has had various problems, the user-pays system may also have several limitations. The most important concern in a user-pays system of infrastructure provision may be related to difficulties in collecting payments. In a large new urban area, the basic task of assessing and collecting is considerable and gives rise to problems such as late provision of infrastructure.

Therefore, alongside the search for innovative financing methods and techniques for the provision of urban infrastructure, the user-pays system in Iran can be judged as a worthwhile experience. Implemented projects have had a significant effect on the urban environment, so that basic infrastructure (roads, water, drainage, sewerage and electricity) have been provided. The new plan has succeeded to some extent in preventing undesired squatter settlements, particularly during a period of rapid population growth and urban expansion.

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Provision of Urban Public Facilities through the Development of Public Commercial Land in Iran

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ABSTRACT

In the context of rapid urban growth and expansion, the provision of key infrastructure elements and public facilities has been a major concern in Iran. The post-revolutionary urban land policies provided a large amount of public land in which distribution of commercial land was one of the problematic issues. In 1986, a new instrumentality was initiated towards efficient use of public commercial land. This paper aims to provide a picture of the policy and to illustrate and assess its outcomes. Using the economic potential of public commercial land, monetary contributions were made towards the provision of public facilities such as schools and clinics in new settlements.

INTRODUCTION

In recent years the means and effectiveness of state intervention in land and property markets has attracted growing interest among academic and professional commentators. Much has been written about using public land for housing and the advantage of public land ownership in the provision of housing as well as basic infrastructure elements such as water, roads, electricity and sewerage systems. However, little research has focused on the economic potential of public land for the provision of public facilities such as schools, parks, sport spaces and health centres as the supplementary elements of the requirements of new settlements.

Following the Islamic Revolution of 1979, Iran experienced rapid growth and physical expansion of its urban centres. The annual rate of population growth reached 3.9% between 1976 and 1986, the highest rate in the country's history. The annual growth rate of urban population increased from 4.9% between 1966 and 1976 to 5.4% between 1976 and 1986.¹ To respond to the infrastructure and public facilities requirements of new urban areas, several policies including the creation of new cities and the policy of urban land development were initiated by the Ministry of Housing and Urban Development (MHUD). The provision of certain urban public facilities by generating funds from the development and sale of public commercial buildings by government instrumentalities was one of these plans. Since 1986, the MHUD developed a large amount of public commercial land and sold commercial buildings and through the profits of selling these buildings, many public facilities were provided across the country.

The arguments regarding the various aspects of post-revolutionary urban land policies, such as the effects of these laws on the land market and the role of
private ownership in economic growth, are too extensive a task for inclusion here. The objectives of this paper are two-fold. Firstly, it examines how the recent plan worked in action. Secondly, it investigates the extent of using the economic potential of public land in providing public facilities and assesses the results of the implementation of the new plan in Iran. The paper consists of three sections. In the first section, conventional provision of public facilities, together with the post revolutionary policies of land ownership and land development, are briefly discussed. The second section deals with the specific policy of the provision of public facilities through the development and selling of certain public commercial buildings. In the final section, an assessment of the results of the implementation of the new policy is undertaken by focusing on three samples of implemented projects as case studies for detailed investigation.

PUBLIC LAND OWNERSHIP AND URBAN LAND DEVELOPMENT

Infrastructure provision and the role of land

In the context of rapid urban growth and the requirements of new residential areas, a large body of research has studied the provision of key infrastructure elements including water, electricity, roads, drainage and sewerage systems and many methods and techniques have been implemented. For example, in the context of financing key infrastructures, while traditionally the public sector was responsible for the provision of infrastructure, there has been a shift to a reliance on the private sector in many countries in the last few decades. Among the reasons for this were overall economic stagnation and growth in the size of government workforces and public bureaucracies. Since then, various financing methods have been used across the world, such as the Land Pooling Readjustment Technique, impact fees, revolving loan funds, contracting out and linkage fees. However, little work has focused on the provision of public facilities such as schools, clinics and sports areas as supplementary elements for desirable living conditions.

In Iran, individuals, private groups and religious organisations had traditionally provided public facilities such as schools and health centres. This was performed through the image of historical cities in which a collection of community centres including mosques and educational centres were designed and constructed by community groups, and governments were less involved in the provision of such services. In addition, some private individuals through in-kind contributions, as well as community organisations, used to participate in the provision of such services. These performances can be seen in many historical Iranian cities such as Yazd, Esfahan and Kerman. However, since about 70 years ago, governments have been directly involved and have become responsible for providing these services. Relevant institutions such as the Ministry of Education, the Ministry of Health and the Sports Organisation were formed to manage the provision of public facilities for new settlements.

Among the requirements of these facilities was land, which is one of the problems of urban development as a whole and the provision of public facilities in particular. Due to the private ownership of land, pre-revolutionary government organisations confronted many obstacles in carrying out their projects. Municipalities had problems in carrying out the proposed projects in cities' master plans such as roads and open spaces. Education, health, and sports organisations also had the problems of land supply in developing new projects. Only in the last years of the pre-revolution period, according to the regulation of development of new urban areas outside of the cities' boundaries (passed in 1976), developers were asked to transfer the plots for public facilities
to the related governmental bodies. However, as will be discussed below, leaving aside the philosophy of post-revolutionary land policies which is not the focus of this paper, public land ownership policies solved many of these problems and gave opportunities to relevant organisations to carry out their projects.

**Urban land policies**

Between the Islamic Revolution in 1979 and 1987, three laws regarding urban land were enacted in the parliament. According to the first law, Urban Waste Land Ownership Abolition Law, passed in 1979, the ownership of all wastelands was abolished and restricted to a maximum 1,000 m² for those land owners who did not possess a house. The second law was the Urban Land Law (ULL), enacted in 1982 for 5 years. According to this law, the Urban Land Organisation (ULO) could acquire land which was currently unused, but with a previous history of use. In addition, according to the Article Nine of the ULL, the ULO could take possession of farms that had been proposed for urban uses in master plans. The acquisition of this type of land was restricted to 32 cities which had higher housing and land demands. The third attempt was the revision and enactment of a new ULL in 1987.

As noted previously, the ideology of post-revolutionary urban land policies is a broad issue and beyond the focus of this paper. Nevertheless, it should be pointed out that the main objectives of these laws were to provide land for housing, as well as land for other public uses, and to curb land speculation. Restricting the amount of land acquired by landholders and prohibiting land transactions except to, or from, the government were among the major points. These laws gave the ULO power of land acquisition in which a large amount of land came under public ownership. In the decade from 1982 to the middle of 1992, land for 746,567 dwellings, covering 16,771 ha, was provided by the ULO. Housing needs of new population led to an immense increase in housing stock. Between 1976 and 1986 the housing stock doubled, increasing from 2,377,586 to 4,685,666 dwellings with an annual increase of 210,000 to 255,000 units.

It can be argued that public land ownership solved many of the problems of land supply arising from private land ownership. The situation provided an opportunity for governmental organisations to supply the land for a particular public use. Through the new urban land policies, the ULO was authorised to grant land to the required organisations for their public projects. Furthermore, the relevant governmental institutions could also acquire the land needed for their public purposes such as administrative buildings, schools, health centres and roads.

The post-revolutionary urban land policies could respond to some extent to the needs of land demand. The timing of urban growth, the prevention of urban sprawl, and control over land speculation were also other advantages of public land ownership. However, in spite of the fact that a large amount of public land was distributed by the ULO in the immediate post-revolutionary period, the most striking phenomena of new urban areas were lack of urban infrastructure and the shortage of public facilities. Along with massive housing production resulting from the distribution of public land for housing, rapid urban expansion took place and the need for both basic urban infrastructure and public facilities became urgent.

According to the urban land policies, the MHUD and ULO were not allowed to sell raw land. In the context of residential development, after dwellings were completed, the ULO was allowed to transfer the title of land to the residents. In the context of commercial land, the MHUD was supposed to develop and construct commercial projects and sell them to applicants by tender selling. The pricing of land acquired and distributed by the ULO for residential purposes
was based on governmental prices, which traditionally were determined by a committee in a given city. This committee included members from various departments and valuation of lots was based on various criteria, mainly location of lots. These prices were much cheaper than free market prices.

**Urban land development**

Until 1985, the provision of urban infrastructure and public facilities for newly urbanised areas in Iran lagged behind the construction of new houses. The MHUD initiated several plans in response to this problem. The first attempt was the policy of urban land development of 1985. This policy had a broad range of objectives including economic viability, environmental considerations, public participation and overall urban development. Article 41 of the regulation of Urban Land Law, approved in the cabinet in 1988, defined land development as a “collection of activities that prepare land for housing”. It classified the activities into two categories: first, basic infrastructure, including road surfacing and asphalt, water and electricity supply, and sewerage and drainage systems; and second, the provision of public facilities such as schools, health centres, police and fire stations, parks and commercial units.

Financing basic infrastructure was based on a user-pays system; in other words, new residents had to pay for infrastructure. Through this system, the provision of basic urban infrastructure in new residential areas became possible and many projects were successfully developed. Until 1992, over 37,580 ha of land were covered by this policy. However, for public facilities such as health and sanitation, education and community organisations, as the second part of the land development objectives, such a process was not initiated. In other words, the user-pays system largely applied to the provision of basic infrastructure mentioned above.

**THE NEW PLAN OF PROVISION OF PUBLIC FACILITIES**

Until 1986, the distribution of commercial land was one of the most important issues facing the ULO. The organisation had to distribute commercial plots at the cheap government prices. Because there was a big difference between government land and free market land prices, there were many applicants for this very cheap land. Consequently, the ULO had to set up criteria for the distribution of this land. There were also environmental and proper urban development concerns resulting from the late distribution of this commercial land. On the one hand, the ULO could not distribute land at the right time because setting criteria and selection of eligible applicants for commercial land took time. On the other hand, new residential areas needed commercial units.

To respond to the problems arising from lack of policy regarding commercial land, a new plan was initiated in 1987. On the basis of articles 47 and 50 of the Urban Land Law’s regulation, the MHUD prepared a guideline in 1988 and communicated it to the Department of Housing Affairs (DHA) for implementation. According to the guidelines, the provincial ULO offices had to present their commercial land to the provincial MHUD offices. Then the process of implementation was to take place through the provincial MHUD and ULO’s offices and central DHA including agreement arrangement between the provincial MHUD offices and central DHA, communication of agreements to the provincial offices or other institutional executers, selection of consultants and contractors, and execution.

According to the guidelines, the three major objectives of this plan were,
Provision of Urban Public Facilities through the Development of Public Commercial Land in Iran

Firstly, initiation of an efficient policy concerning public commercial land. Provision of public facilities through the development of commercial land was the second objective. Thirdly, this plan was considered as a contribution towards proper urban development by provision of commercial centres as one of the requirements of new residential areas.

As noted above, the ULO was not allowed to sell raw public land for either residential or commercial purposes; however, it was allowed to transfer the title of lots to residents after the completion of buildings. According to the new guidelines regarding the development of public commercial land, the MHUD and the ULO could sell constructed commercial projects to applicants, while they were not allowed to sell raw public commercial land. The process of sale of constructed commercial projects was based on selling by tender and the invitation for tender was advertised in newspapers. A tender committee was also formed in each province by involving various organisations in each city. Initial financing for the commercial projects was through revolving funds channelled by the MHUD.

The profits generated from this process had to be spent for the provision of certain public facilities. As such, 30% of the profits of the commercial project was given to municipalities to provide services, giving priority to green spaces. The remaining 70% of the profit was to be spent by the MHUD on the provision of social and public facilities such as schools, health centres and sport areas.

From 1988 to 1991, 174 agreements were communicated to the provincial MHUD offices under the new policy. The total floor space of commercial plans was 2,100,084 m². It was estimated that the total income from sale of these projects will be some 87,315 million Rials, of which 27,361 million Rials will be granted to municipalities for the provision of green space. It was proposed that by using the profits of commercial projects, 785,183 m² of educational spaces and 213,511 m² of clinical units could be built (Table 1).

Table 1. Proposed provision of public facilities through the profits of public commercial land in Iran from 1988 to March 1991

<table>
<thead>
<tr>
<th>Proposed floor space (m²)</th>
<th>Proposed costs (million Rials)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial projects</td>
<td>2,100,084</td>
</tr>
<tr>
<td>Educational projects</td>
<td>785,183</td>
</tr>
<tr>
<td>Health centres</td>
<td>213,511</td>
</tr>
</tbody>
</table>


One of the concerns of the new plan was the economic viability of new commercial projects. An economic analysis report was required for approval of the agreements between provincial MHUD’s offices and the DHA. This analysis was intended to ensure that projects were economically viable. However, after construction, several factors may have given rise to problems. One of the most important problems was related to the time of implementation of commercial projects in different phases. As noted earlier, most of commercial projects were to be constructed within the new residential land development projects. If the commercial projects had been constructed in the first stages of the implementation of the related land development projects, they could not obtain the proposed profit. This was because not enough residents were accommodated in the new residential area to require commercial units. Subsequently, there was not enough demand in tender selling and the commercial projects may be sold for a cheaper price. On the other hand, if they were constructed in the later stages, two subsequent problems might emerge. Firstly, the given community
may suffer from the lack of commercial units, shopping centres and other services, leading to improper urban development. Secondly, on the basis of community needs, unauthorised commercial units may appear. Therefore, this issue can be judged as one of the limitations of the plan affecting its economic viability.

To respond to this concern, a recommendation was made in the guidelines that the projects should be sold in various phases. This recommendation was an efficient decision for two reasons. On the one hand, the implementation of new urban land development projects, where commercial units were located, occurred over time. Subsequently, the accommodation of new residents took place at different times and the demand for commercial units changed. On the other hand, limited sale offering of commercial projects in various stages of tender could affect their economic viability because of the extent of demand and the prices of the constructed commercial units offered by applicants. Consequently, more public facilities could be provided.

Another method that was found to be economically viable was the implementation of the new plan through other institutions such as banks and welfare organisations as well as individuals. If these institutions were interested in participating, they then could sign an agreement with the MHUD. Furthermore, the private sector or individuals could participate in the implementation of particular projects. With some land usages such as pools, cinemas and oil stations there was not enough demand or there was insufficient economic return. In these cases, the land was rented to applicants for the period of implementation.

When the projects were completed by the private sector and sold, the title of commercial land was transferred to participants. In this process, the market value of the land was returned to the MHUD and the amount of capital invested plus profit was the share of the other participants. The implementation of the new plan through the participation of these institutions or private sector and individuals had two advantages. Firstly, the implementation of commercial projects did not require government funds. This could be one of the basic tasks for the MHUD's intervention in the process of implementation that required a large amount of revolving funds. Secondly, there was little risk for the MHUD to invest for commercial projects.

Three Case Studies

This section of the paper deals with the analysis of the planning and development processes of three particular projects. It examines the relationship between the development of public commercial land and the use of resulting profits for the provision of public facilities. These projects are assessed to give a picture of how the new plan worked and what the outcomes were.

Two case studies in the city of Esfahan

Esfahan is one of the largest cities in Iran, with a population of 987,000 in 1986. Since the revolution of 1979, various plans, including several land development projects, three new satellite cities and several commercial projects, were implemented in this city. Among the commercial projects, two were the most significant because of their sizes and the amount of capital channelled by the MHUD. These two projects were Amirhamzeh and Imamzadeh Zeid.

The Amirhamzeh project, located in the inner west of the city, commenced in 1987. It covers 5,000 m² of land with 2,800 m² of floor space, constructed in three storeys. It was designed as a shopping centre for the new residential area of Amirhamzeh and implemented under the new plan. The project contains
57 shops and six other service units. The total expenditure channelled by the MHUD for this project was 301.8 million Rials. Up until 1993, 50 shops and one office unit had been sold for 635.9 million Rials.

Until 1993, although the whole project was not sold, evidence shows that a large amount of profit was gained by the MHUD through the implementation of this project. As noted above, according to the plan, of the total profit of the project, 30% was the portion to be granted to the municipality of Esfahan for the provision of parks and green spaces. The remaining 70% was to be spent on providing public facilities. Through the 70% of the profit of this project, by 1993, a school covering 2,220 m² of floor space comprising 18 classrooms was built on 3,500 m² of land. This school was built in the residential area where the commercial project was developed costing 120 million Rials.

The second commercial project in Esfahan was Imamzadeh Zeid. It covers 1,320 m² of land and 2,100 m² of floor space built in three storeys. It contains 18 shops and 12 offices/service units. The areas of shops range from 13 m² to 59 m². Like the Amirhamzeh project, this project was designed as a shopping centre for a new residential area.

The MHUD’s provincial offices could also start the implementation of schools parallel to the implementation of commercial units by using the revolving funds channelled by the MHUD. This could be undertaken where the MHUD ensured that the income from the sale of commercial units would be enough to construct educational space. Therefore, using the potential profit of the Imamzadeh Zeid commercial project, the MHUD’s provincial office developed a relatively large school covering 2,550 m² of floor space, comprising 26 classrooms and costing 140 million Rials.

Through the implementation of these two projects, the residents of the related sites were able to gain access to both commercial and educational services. Newly accommodated residents needed the commercial centres as one of the public facilities for daily requirements. Providing these elements through this plan occurred on the basis of planned projects, whereas, in the absence of the plan, these centres may have been provided by individuals without a planning scheme. Instead, in the process of planning for these commercial projects, comprehensive studies were undertaken by consultants and the projects were planned on the basis of the anticipated requirements of the communities who would use them. Through this policy, at least one major shopping centre, together with a large school, were developed in the newly developed residential areas, Amirhamzeh and Imamzadeh Zeid, which may be seen as a process towards proper urban land development.

However, many factors, such as the location of projects and users accessibility to the commercial centres, can affect the desirability of projects. For example, despite the fact that the Imamzadeh Zeid project was completed in late 1990 and its total expenditure was 161.4 million Rials, only 30–35% of commercial units were sold by 1992. The total amount of the sale was 72.8 million Rials; less than its expenditure. If the whole project had been sold on the basis of previous experience of selling earlier commercial units, the total sale would be worth some 220 million Rials which would have covered the expenditure, although the profit would have been less than that from the Amirhamzeh project.

A case study in the city of Bushehr

The city of Bushehr, with a population of 121,000 in 1986, is located on the Persian Gulf. Since the revolution of 1979, like other cities across the country, several urban development projects including several commercial and public facilities in Bushehr, and a new city were developed. The Baq-e Zahra commercial project was amongst those developed under the new policy. It
was built on a site of 2,427 m² of land. The site is located in the inner city and was originally allocated for commercial use in the city's master plan. The construction of this project, comprising 4,566 m² of floor space, began in 1987 and was completed in 1989. It contains 67 shops and 15 office units and the areas of the shops range from 21 m² to 34 m², all located on the ground floor. The areas of service units, such as offices for consultants, range from 82 m² to 118 m² and are located on the first floor.

Based on the guidelines for selling projects in various phases, as noted above, the first tender-sale ceremony took place 2 weeks after its completion and the two others took place 6 and 12 months later, respectively. The total expenditure was 341 million Rials and it was sold for 572 million Rials. According to the guideline, 30% of the profit of the commercial project was granted to the municipality of Bushehr for the provision of green spaces and other services. The remaining profit of 168 million Rials was spent in the provision of a school in the new city of Aalishahr.

The new city of Aalishahr has been developed since 1987, located 25 km north-west of Bushehr on the Bushehr–Borazjan road. The MHUD initiated a policy in 1985 for creation of new satellite cities for large cities as well as for those with specific programmes, such as growth poles. The major objectives of creating new cities were as follows. Firstly, following the growth and physical expansion of large cities such as Tehran, Mashhad, Esfahan, Tabriz and Shiraz, it was planned to settle their new population in discontinuous development areas. The second main objective was to meet the requirements of newly established industrial sites in cities such as Arak and Bandar Abbas. The third major objective was the creation of new cities where the existing cities had limitations of land supply and physically contiguous expansion, such as the city of Bushehr. Therefore, the new city of Aalishahr was planned to be developed for the surplus population of Bushehr.11

The provision of infrastructure and public facilities in the new city of Aalishahr was one of the first requirements of new residents. Basic infrastructure elements such as roads, water and electricity were planned to be provided through funding by the city corporation which was already established to implement the development of the new city. In addition, responsible organisations, including education and health ministries together with the city corporation were relied on to provide relevant public facilities over time; parallel to the accommodation of new residents, timely provision of public facilities was an important issue. Therefore, to assist the development of the new city and the timely provision of these public facilities, the MHUD’s provincial office developed the first school there by using the profits of the Baq-e Zahra commercial project.

CONCLUSION

The main question posed at the beginning of this paper was whether the economic potential of public commercial land can be used for the provision of public facilities. Following the post-revolutionary urban land policies, almost all Iranian cities have had, at least, a new land development project which contained a large amount of public commercial land. Instead of distribution of commercial land to applicants, as was undertaken for residential land, the Ministry of Housing and Urban Development initiated a new alternative plan. Two major objectives of this plan were, firstly to solve the problems of distribution of commercial land, secondly, the development of public facilities through the economic potential of these lands.

Although the provision of public facilities remains the responsibility of various governmental bodies, the new plan for provision of such services through the
profits of the development of public land has had remarkable outcomes in the new residential areas of the Iranian cities. Through the implementation of the new plan in Iran, hundreds of schools, clinics and health centres, parks and sport centres were provided across the country which may have not occurred in its absence. Three case studies revealed a number of features of the use of profits from development of public commercial lands for financing some necessary public facilities in new residential areas. Furthermore, the implemented projects were environmentally sensitive in the process of urban development as a whole. The design and implementation of commercial and public facilities projects were made through comprehensive planning, in which the basic requirements of residents in new urban areas were considered.

The timing of implementation of the new projects and bureaucracy, however, may be judged as the limitations of such plans. The preparation of plans together with their implementation may take time, while the residents of new urban areas need public facilities immediately. Furthermore, the economic aspects of the plan was another important concern. Some commercial projects could not be implemented because they were not economically viable. Subsequently, public facilities could not be provided.

Through the assessment of the plan, it can be suggested that by using this alternative plan, the profits may return to the community as the certain owners of public land. While the governmental organisations remain officially responsible, this plan can be also proposed as a monetary contribution to the process of provision of public facilities in Iran, while its urban centres are growing rapidly. However, it may be suggested that the Iranian situation is rather unique and this policy can only apply in the context of public land ownership. Nevertheless, in the development process of new residential areas, even by the private developers, such methods can be used to provide infrastructure and public facilities similar to those that occurred in Land Pooling Readjustment Technique in many countries.

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NOTES

1. MHUD, Amar Va Eteksat-e Payeh-e Bakhsh-e Maskan [Basic Statistics and Data of the Housing Sector], (MHUD, Tehran, 1992), in Persian.
5. Urban Land Organisation (ULO) is a governmental organisation which was established after the Islamic Revolution to implement urban land policies.


9. For detailed information on the policy of urban land development, its economic and environmental aspects and the provision of urban infrastructure in Iran, particularly the effectiveness of user-pays system, see Mohammad Mehdi Azizi, “The Provision of Urban Infrastructure in Iran: An Empirical Evaluation”, *Urban Studies* 32 3 (1995), forthcoming.

10. The data for this section were collected by means of a questionnaire distributed to the provisional MHUD offices in the cities of Esfahan and Bushehr in 1993.